FIRSTBEAT SPORTS 4.2 USER GUIDE

FIRSTBEAT

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WELCOME TO FIRSTBEAT SPORTS USER GUIDE

Firstbeat SPORTS is designed for professional use for monitoring training load and recovery and for fitness testing. The analysis are based on heart rate variability producing comprehensive in-depth information on physiology to improve competitive performance in elite sports. This user guide will concentrate on technical information on how to use all the features in SPORTS software effectively.

In addition to this user guide you can take the advantage of other Firstbeat support material through our online learning center: www.firstbeat.fi/sports/learning-center including:

- Tutorial videos
- Report interpretations
- Background physiology
- Practical tips for using the data

SOFTWARE FEATURES

This chapter describes the key features for monitoring the training load and recovery.

ANALYSIS OF THE TRAINING LOAD

Tools for analyzing training load:

- In **Measurements** view **the** key variables describing the training are summarized
- With the **Dashboard** view you can see at glance the training load compared to the recovery level. You can also compare the training load and recovery between different athletes and groups.
- **With the Training monitor** and Firstbeat team system you can monitor up to 80 athletes training at the range of 200 meters. This gives the possibility to follow the training at real time and ensure the 100% success of the training session. The data collected through real time monitoring is also stored automatically for post analysis
- **The Data Export** features give the possibility to export measurement data in CSV file to be analyzed e.g. in Excel.
- **With the Training report** you can see the essential information about training sessions and share the information for others.
- **With the Training group report** you can see the training load at the group and individual level and share this information with others.

RECOVERY FOLLOW-UP

Tools for recovery follow-up:

- **From the Measurements** view you can find graphs about stress and recovery reactions during the measurements. At the measurement table you can check the recovery index and quick recovery test scores.
- **With the Dashboard** view you can see at glance the training load compared to the recovery level. You can also compare the training load and recovery between different athletes and groups.
- **With the Recovery report** you can see the essential information about night recovery and share the information for others.
- **With the daily stress and recovery report** you can analyze the athlete stress and recovery reactions during the measurement period.
- **Quick recovery test** is heart rate variability based test to determine athletes recovery and readiness prior to training. Test duration is 5- minutes and it can be executed to whole team at same time giving effective tool for coaches to screen the recovery of the whole team at once.

FITNESS TESTING

Tools for fitness testing:

- **Fitness test reports** can be used for supported fitness testing protocols including options for cycling, rowing and running.
- **Training monitor** can be used for data collection during the fitness test for a group of athletes.
- Fitness test follow-up report can be used for monitoring the fitness progress between

tests.

FIRSTBEAT CLOUD

Firstbeat CLOUD is an additional service for remote coaching and multi-SPORTS license users for flexible data management. Please ask for more information from your Firstbeat contact person regarding the availability of the service.

- **Shared data base:** With sync tool you can load profiles and measurements into Firstbeat cloud and share the database with other SPORTS users in your own organization.
- **Remote data uploading:** With sync tool you can create accounts for single athletes for downloading recovery and training data remotely using Firstbeat Uploader.

SYSTEM REQUIREMENTS

Firstbeat SPORTS software system requirements:

- Windows XP, 7, 8 OS
- Memory 512 Mt.
- Processor 1 GHz
- Screen resolution 1024x768
- Hard drive space 500 Mt
- Adobe Acrobat reader 5.0 or newer for opening the reports.

NOTE!
Analysis results require large amounts of hard disk drive depending on the amount of analyses conducted. 1000 hours of analyzed R-R data takes about 250MB of hard disk drive space.

SUPPORTED MEASUREMENT DEVICES

Firstbeat SPORTS software is compatible with many different manufacturers measuring devices. Below you will find the complete list of the supported devices.

For individual use:

- Firstbeat: BODYGUARD, BODYGUARD II, Team receiver, Dongle
- Garmin: Forerunner 910XT, 610
- Suunto: t6, Memory Belt, team pod
- Polar S810, RS 800CX, CS 600, Team system2 (data exports)

GETTING STARTED

This chapter guides you to download, install and activate the software to your computer and provides you tips in making the default settings correct to your usage.

1 INSTALL FIRSTBEAT SPORTS SOFTWARE

After the purchase you will receive download link and activation key for the software.

Firstbeat SPORTS software can be downloaded from http://www.firstbeat.fi/download/download. You will receive the username and password for download section upon the purchase.

1. Install the Firstbeat SPORTS software by double cliking the ”SPORTS_(version_number).exe file from the downloading folder
2. Follow the instructions shown on the screen. It is also recommended to install the required hardware drivers during the software installation.
3. After the installation program start the program and activate the software with an activation key (see Software activation chapter).

2 SOFTWARE ACTIVATION

Firstbeat SPORTS features a product activation to protect users’ rights and prohibit non licensed use of the software. Firstbeat SPORTS must be activated before it’s ready for use. Each activation key can be used only once.

The easiest way to activate the software is to connect the computer online during the activation process but also manual activation can be performed.

NOTE!
If a firewall software is on use on the computer, it might prompt of new program trying access Internet. Allow the program to access Internet.

INTERNET ACTIVATION

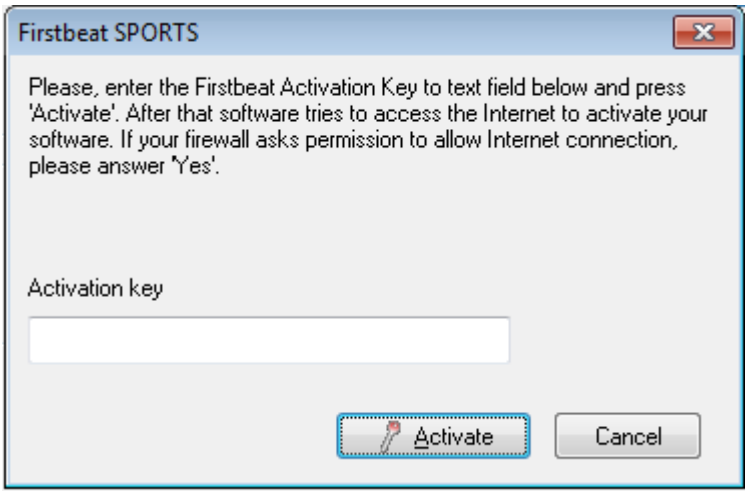

Firstbeat SPORTS
Please, enter the Firstbeat Activation Key to text field below and press 'Activate'. After that software tries to access the Internet to activate your software. If your firewall asks permission to allow Internet connection, please answer 'Yes'.
Activation key
Activate
Cancel

Figure 1. Internet activation

1. Type in the activation key to the field labeled ‘Activation key’, be sure to type it correctly, it’s recommended to use the clipboard to copy the key to its field.

2. When activation key has been entered, press button labeled ‘Activate’. If firewall software is on use on the computer, it might prompt of new program trying access Internet. Allow the program to access Internet. You will get the notice “License activated” after the successful activation process.

If the internet activation fails, program will shift to the manual activation dialog as shown below.

E-MAIL ACTIVATION

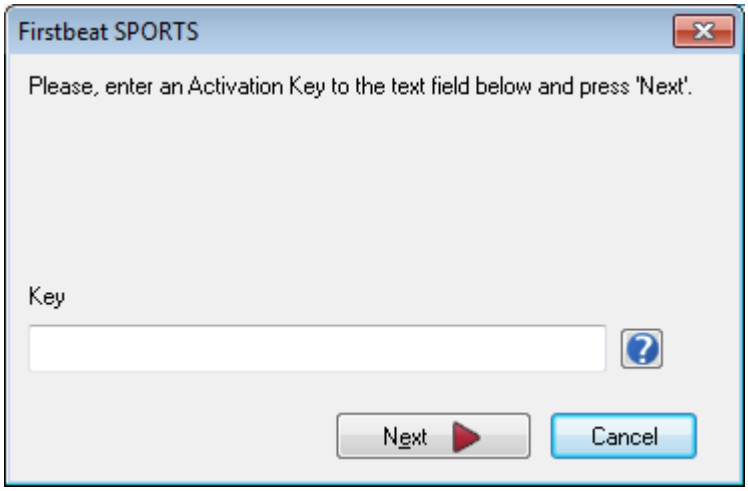


Figure 2. E-mail activation step 1.

1. To activate the product manually, type in the activation key into the edit field labelled ‘Key’.
2. When activation key has been successfully entered into the edit field, press ‘*Next*’.

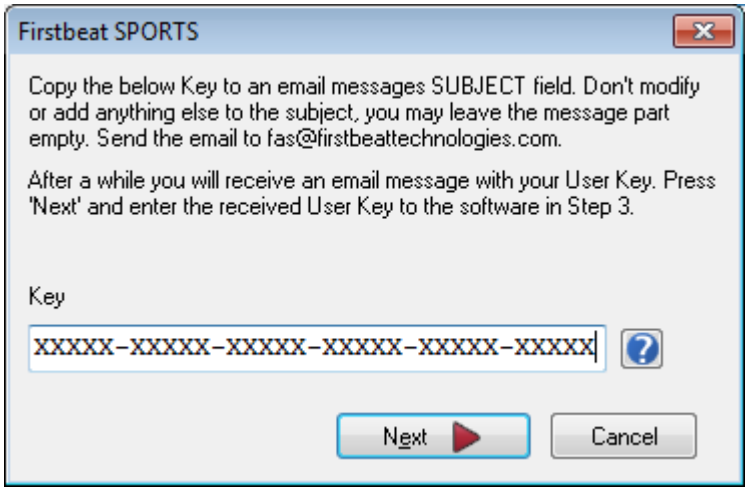

Firstbeat SPORTS
Copy the below Key to an email messages SUBJECT field. Don't modify or add anything else to the subject, you may leave the message part empty. Send the email to fas@firstbeattechnologies.com.
After a while you will receive an email message with your User Key. Press 'Next' and enter the received User Key to the software in Step 3.
Key
XXXXX-XXXXX-XXXXX-XXXXX-XXXXX-XXXXX
Next
Cancel

Figure 3. E-mail activation step 2.

At this point, functional e-mail service has to be in use. Compose a new e-mail message. Copy & paste the key to the Subject field. Send the e-mail to fas@firstbeattechnologies.com

E-mail program might prompt for empty body part of the e-mail message, ignore it and continue to send the e-mail message.

Within few minutes a reply message should be received. The message contains the user key. Copy & paste it to the edit field labelled 'Key'.
Having entered the user key, press button 'Next'. Now the product is activated and ready to be started.

3 DEFINE IMPORTANT SOFTWARE SETTINGS

Firstbeat SPORTS software includes a set-up wizard to help you to get stated easily. The set-up wizard will start automatically at first time when you run the Firstbeat SPORTS. You can open the set-up wizard also afterwards by clicking '*Help*' → '*Set-up wizard*' from the upper menu bar.

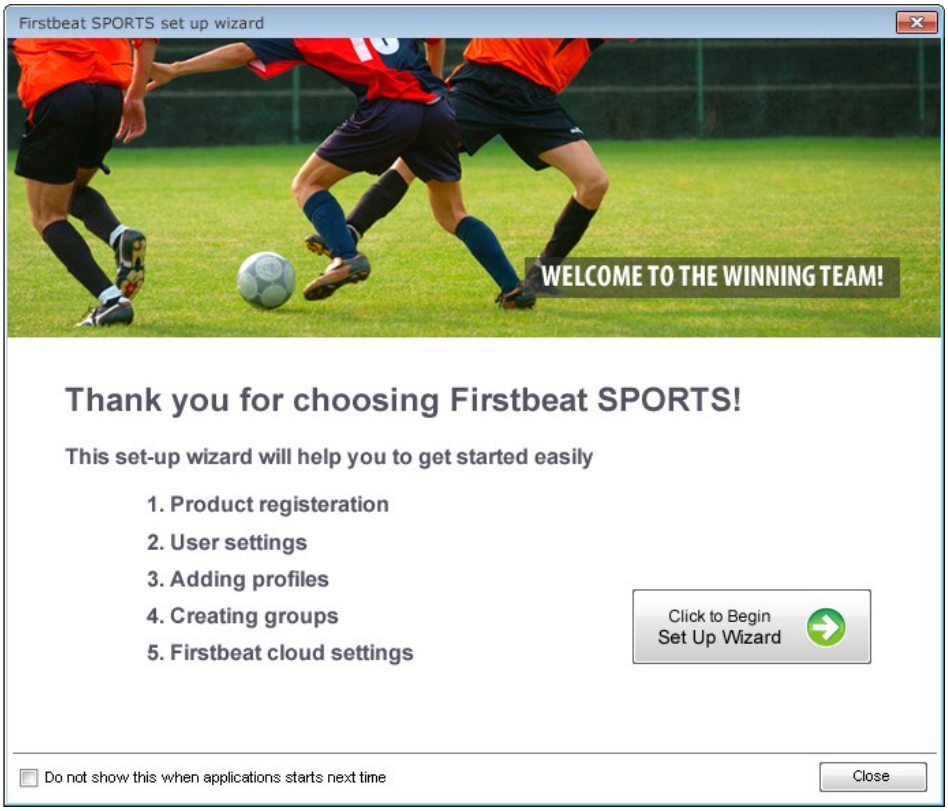

Firstbeat SPORTS set up wizard
WELCOME TO THE WINNING TEAM!
Thank you for choosing Firstbeat SPORTS!
This set-up wizard will help you to get started easily
1. Product registeration
2. User settings
3. Adding profiles
4. Creating groups
5. Firstbeat cloud settings
Click to Begin
Set Up Wizard
Do not show this when applications starts next time
Close

Figure 4. Firstbeat SPORTS set-up wizard.

Run the set-up wizard by following the set up wizard instructions. It will help you to get started with actual software.

It is recommended to define also some other settings of the software before use:

1. **Select variables to be shown in measurements view.**
   By selecting the variables which are shown in the measurements table you will help the analysis of the training and recovery information. Select visible variables by clicking the '*View setting*' from under the measurements table.
2. **Define training monitor settings**
   If you have the hardware to use Training Monitor it is recommended to define the training monitor settings to correspond to your use of the software. See the detailed instructions from the chapter Training Monitor.
3. **If you want to add your company logo and text to the feedback reports**
   You can add your company logo and text to the feedback reports by clicking '*Tools*' → '*Options*' → '*Reports*'.

MEASUREMENTS VIEW

There are two views in the program: Measurements view and Dashboard view. The measurements view of the program is used to manage measurements of the selected profile.

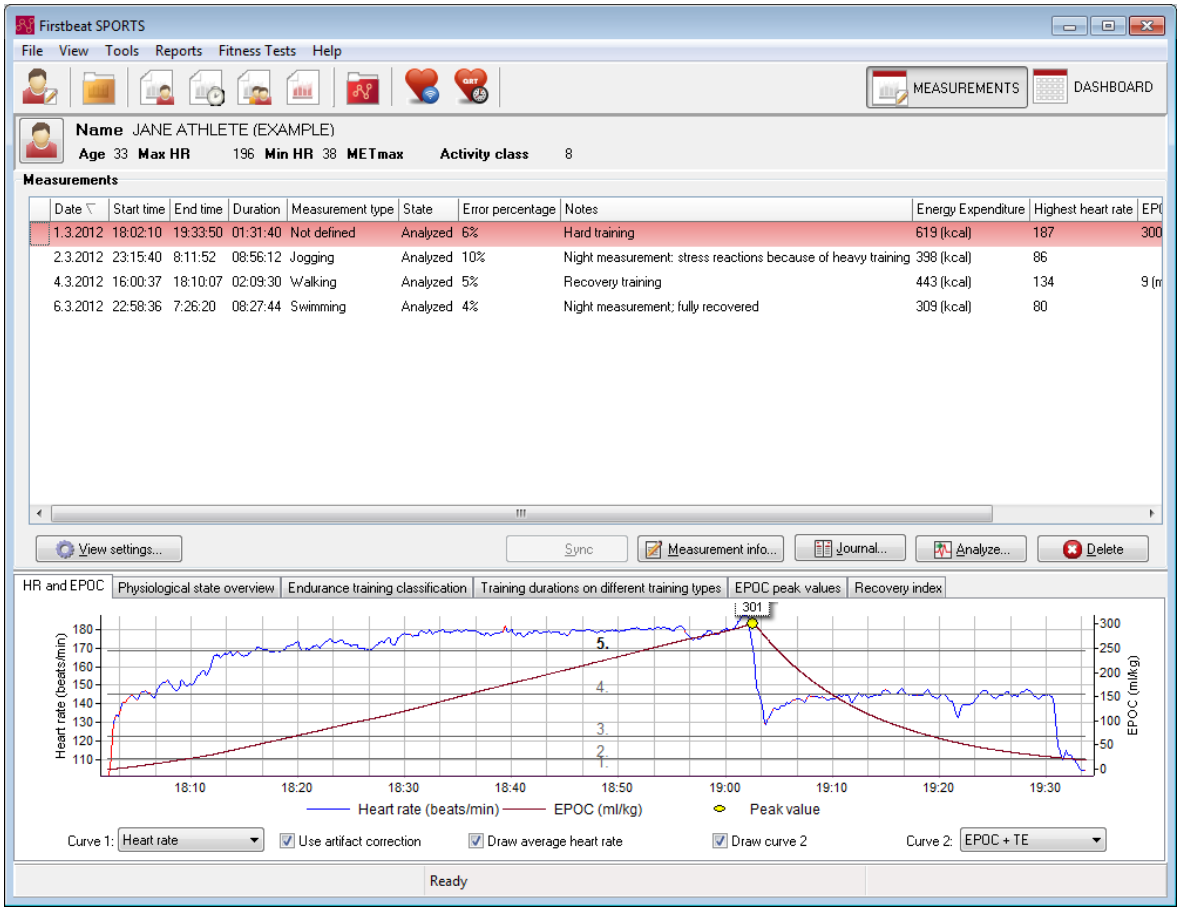

Firstbeat SPORTS
File View Tools Reports Fitness Tests Help
MEASUREMENTS
DASHBOARD
Name JANE ATHLETE (EXAMPLE)
Age 33 Max HR 196 Min HR 38 METmax Activity class 8
Measurements
Date Start time End time Duration Measurement type State Error percentage Notes Energy Expenditure Highest heart rate
1.3.2012 18:02:10 19:33:50 01:31:40 Not defined Analyzed 6% Hard training 619 (kcal) 187
2.3.2012 23:15:40 8:11:52 08:56:12 Jogging Analyzed 10% Night measurement: stress reactions because of heavy training 398 (kcal) 86
4.3.2012 16:00:37 18:10:07 02:09:30 Walking Analyzed 5% Recovery training 443 (kcal) 134
6.3.2012 22:58:36 7:26:20 08:27:44 Swimming Analyzed 4% Night measurement; fully recovered 309 (kcal) 80
View settings...
Sync
Measurement info...
Journal...
Analyze...
Delete
HR and EPOC
Physiological state overview
Endurance training classification
Training durations on different training types
EPOC peak values
Recovery index
Heart rate (beats/min)
EPOC (ml/kg)
Heart rate (beats/min)
EPOC (ml/kg)
Peak value
Curve 1: Heart rate
Use artifact correction
Draw average heart rate
Draw curve 2
Curve 2: EPOC + TE
Ready

Figure 5. Measurements view

The measurements table displays the loaded R-R files. Shown variables and filters can be selected from the '*Tools*' -> '*Options*' -> '*View*' including the options below.

- Date (Measurement start date)
- Start time(Measurement start time)
- Duration (The duration of the measurement)
- Measurement type
- State
    - Analyzed
    - Not analyzed
    - Out dated
- Error percentage
- File name
- Notes
- Height
- Weight
- Activity class
- Energy expenditure
- Highest heart rate
- EPOC peak

- Training effect
- TRIMP
- Highest heart rate
- Average heart rate
- Recovery index
- Scaled recovery index
- Quick recovery test score
- GPS Data
- Distance
- Maximum speed
- Average speed
- Average pace
- Maximum altitude
- Minimum altitude
- Ascent
- Descent
- Maximum cadence
- Average cadence

The measurement information button displays three different tabs.

The measurement information tab displays general information on the currently selected, active, measurement (the measurement selected on the measurements table).

The profile information tab displays the personal parameters that applied during the measurement. Profile information can be modified if some of the earlier values have changed such as min HR decreased or weight increased.

Each measurement has information of the person profile parameters that were valid during the measurement. Those parameters can be changed. After such modification the measurement becomes outdated and must be reanalysed.

Measurement information and profile information can also be set and modified for multiple measurements simultaneously.

NOTE!
Profile information at the time of the measurement represents the profile information during the start time of the measurement, while the profile information in profile management dialog stands for the current, today's, profile information. When a new R-R file is loaded and new measurement is created, the new measurement's profile information is based on the current profile information.

The bottom part of the measurements view shows different charts, HR and EPOC, physiological state overview, endurance training classification, Training durations of different training types, EPOC peak values and recovery index.

Possible variables in the HR and EPOC chart:

- Heart rate
- EPOC + TE
- %VO2max
- Distance
- Respiration
- Altitude

- Speed
- Energy Expenditure
- Cadence

Also lap times are shown in the measurement's view graphs.

REVIEWING MEASUREMENTS

The measurement view of Firstbeat SPORTS enables viewing of measurement's belonging to the selected profile. The measurement view displays information on measurements such as some HR related figures, different charts, physiological state overview and endurance training classification.

1. Click on the measurement on the measurements table.
2. Information of the selected measurement is displayed and measurement chart is shown in the bottom of the screen. Different charts, physiological state overview or endurance training classification can be selected to be shown by changing the tab selection.
3. With the HR chart the style how the chart is drawn can be chosen. Use the check boxes to change the view.

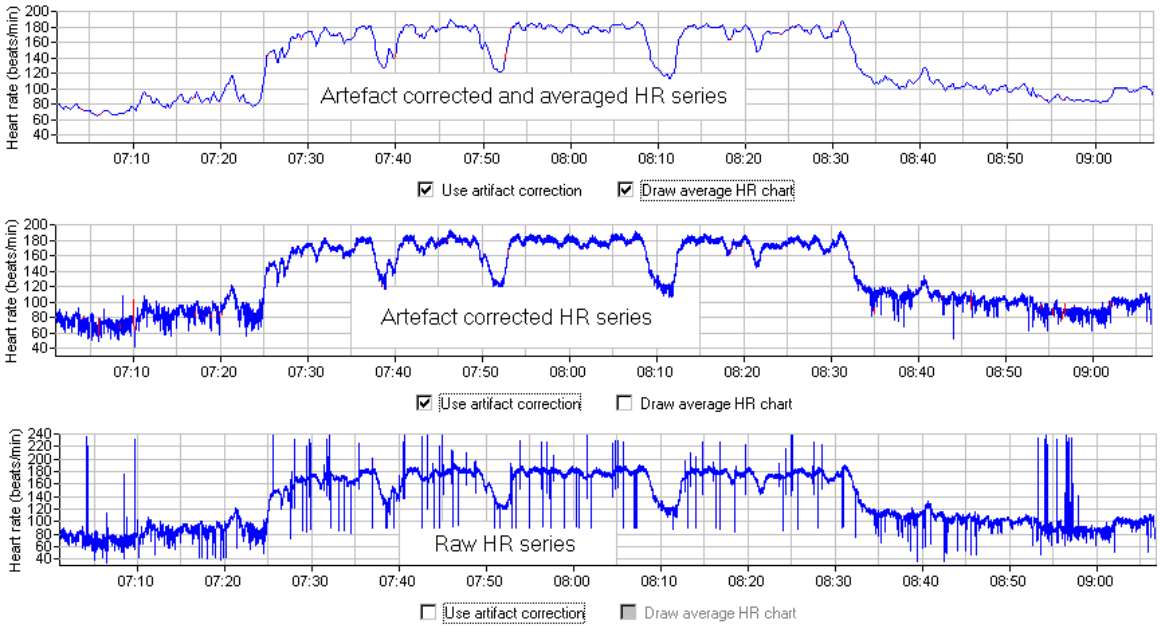


Figure 6. The HR chart can be viewed with artifact correction and averaged HR series enabled or disabled

Note!
The HR chart can be zoomed by holding down left mouse button and moving mouse to right and down, the zoom is reset by holding down left mouse button and moving mouse to up and left. The chart can be scrolled by holding down right mouse button and moving mouse over the chart.

DASHBOARD VIEW

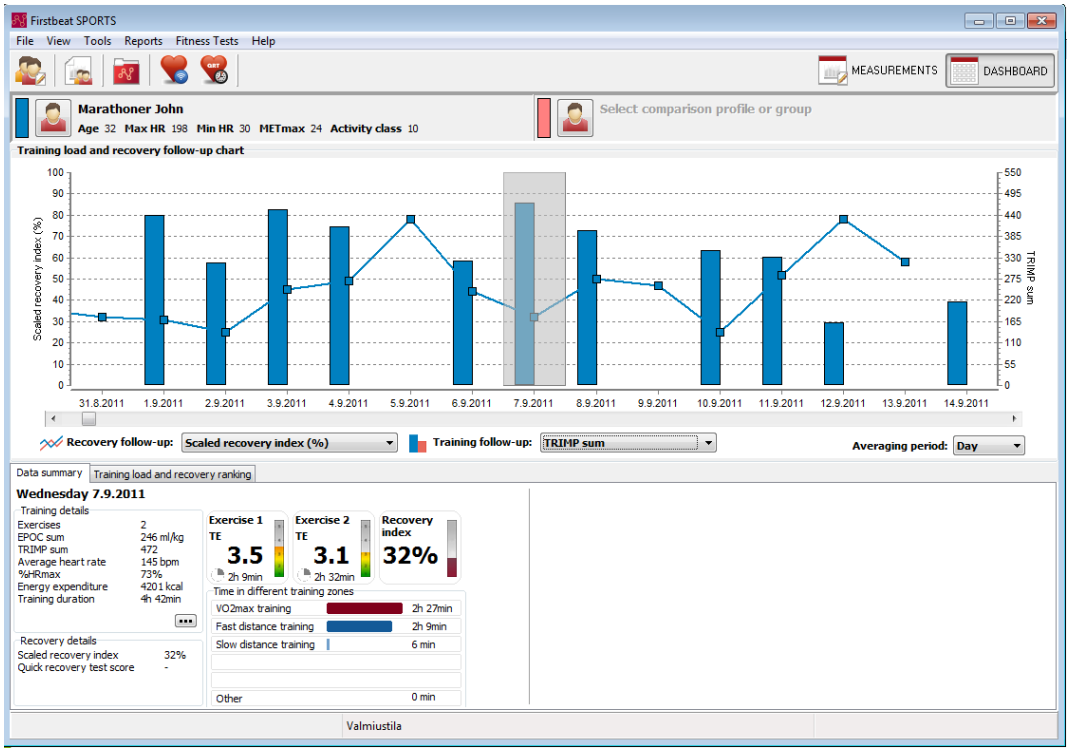


Figure 7. Dashboard view

Dashboard is designed for following and comparing the training load and recovery between individuals and groups. The main chart plots the selected training load (bars) and recovery parameters (line) to the same chart.

“Data summary” provides more detailed information on training load and recovery variables from the selected time period.

With ”Training load and recovery ranking tool” you can sort the athletes from highest to lowest value and vice versa for both training load and recovery parameters.

Please note!
Dashboard view shows the training and recovery measurements according to follow-up selection each measurement has (exercise/night/daily stress/quick recovery). If you have unrealistic values in dashboard view, please check the follow-up selections in Measurement-view.

SELECT GROUP OR PROFILE

In Dashboard view you can select persons or groups to be shown in dashboard view. Select/change the group or profile by clicking the “profile” icon shown in the profile view.

TRAINING LOAD AND RECOVERY FOLLOW-UP

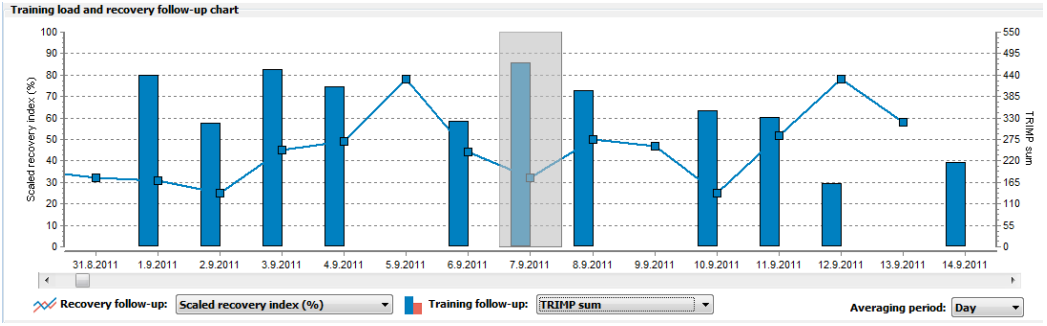


Figure 8. Training load and recovery follow-up chart

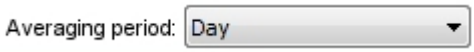
Training load and recovery are shown in the same chart allowing the user to see the effects of training on recovery.

In recovery follow-up selection you can select the parameter describing recovery status. Recovery is shown with the line in chart illustrating the average of all the athletes within the selected group.

- Scaled recovery index: Overnight recovery index 0-100%
- Quick recovery test score

In Training follow-up selection you can select the variable describing training load. Training load parameter is described with bars illustrating the average of all the athletes within the selected group.

- EPOC sum: Sum of EPOC peaks (ml/kg) of all the training sessions during the averaging period.
- TRIMP sum: Sum of TRIMP values of all the training sessions during the averaging period.
- Training duration: Duration of all the measurements which are marked as training mesurements during the follow-up period
- Average heart rate: Heart rate average is calculated from the total measurement time of all the training measurements.
- %HRmax: Average intensity level is calculated from the total measurement time.
- Training sessions: Number of measurements which are marked as training session.



Averaging period can be set to Day/Week or Month and information in the chart is calculated accordingly.
You can move in the chart using the slider or by drag the chart with the mouse.

SUMMARY - TAB

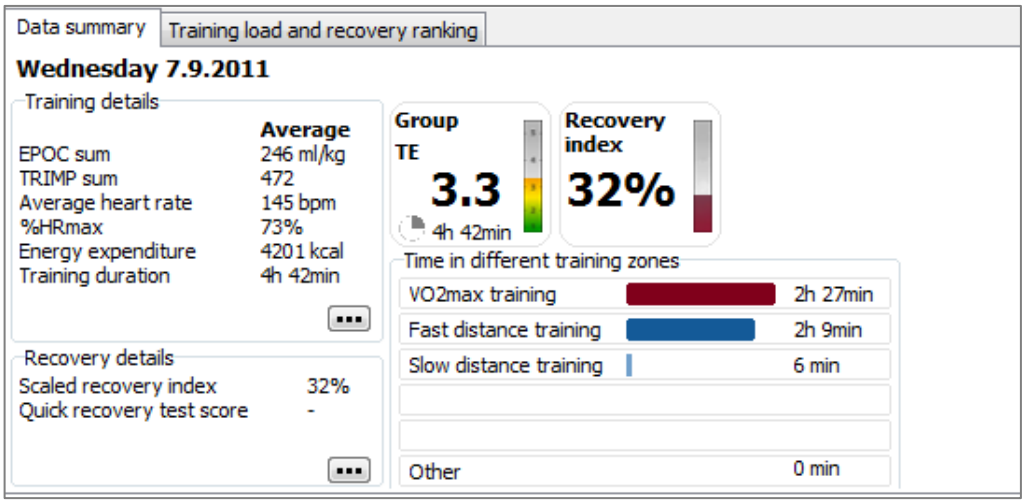


Figure 9. Summary - tab

Data summary shows the details of the measurement selected in the chart. The key information of the training and recovery is presented in boxes.

Time in different training zones is shown in minutes. The names of the zones are taken from the general training zone settings.

By clicking the button with 3 dots, you will get more information on range values and number of measurements.

TRAINING LOAD AND RECOVERY RANKING

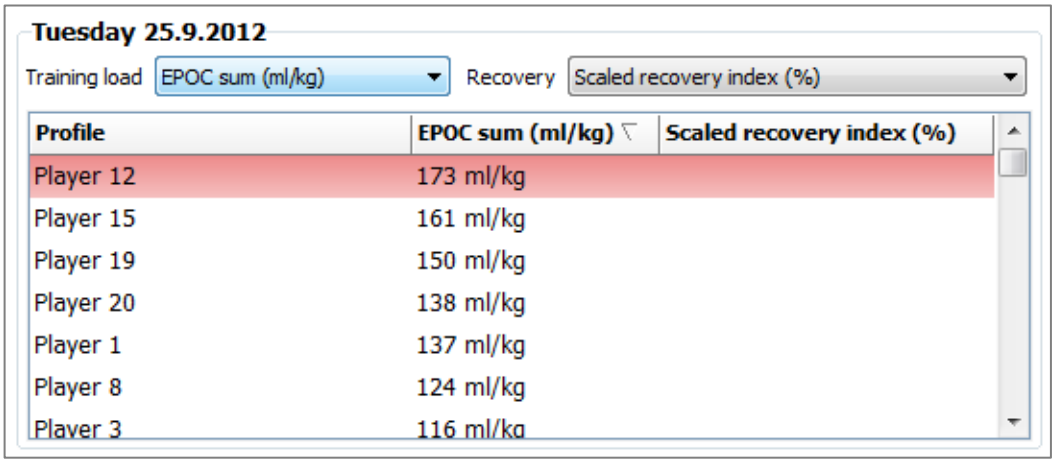


Figure 10. Training load and recovery ranking tab

In training load and recovery ranking the athletes who have data from the selected time period are listed. Variables can be changed from the drop down-menu and the players can ranked from highest to lowest or lowest to highest by clicking the variable in the list

PROFILE AND GROUP MANAGEMENT

From this chapter you will get the information how to create, delete and edit user profiles and groups. You will find also information about user profiles change history and background information.

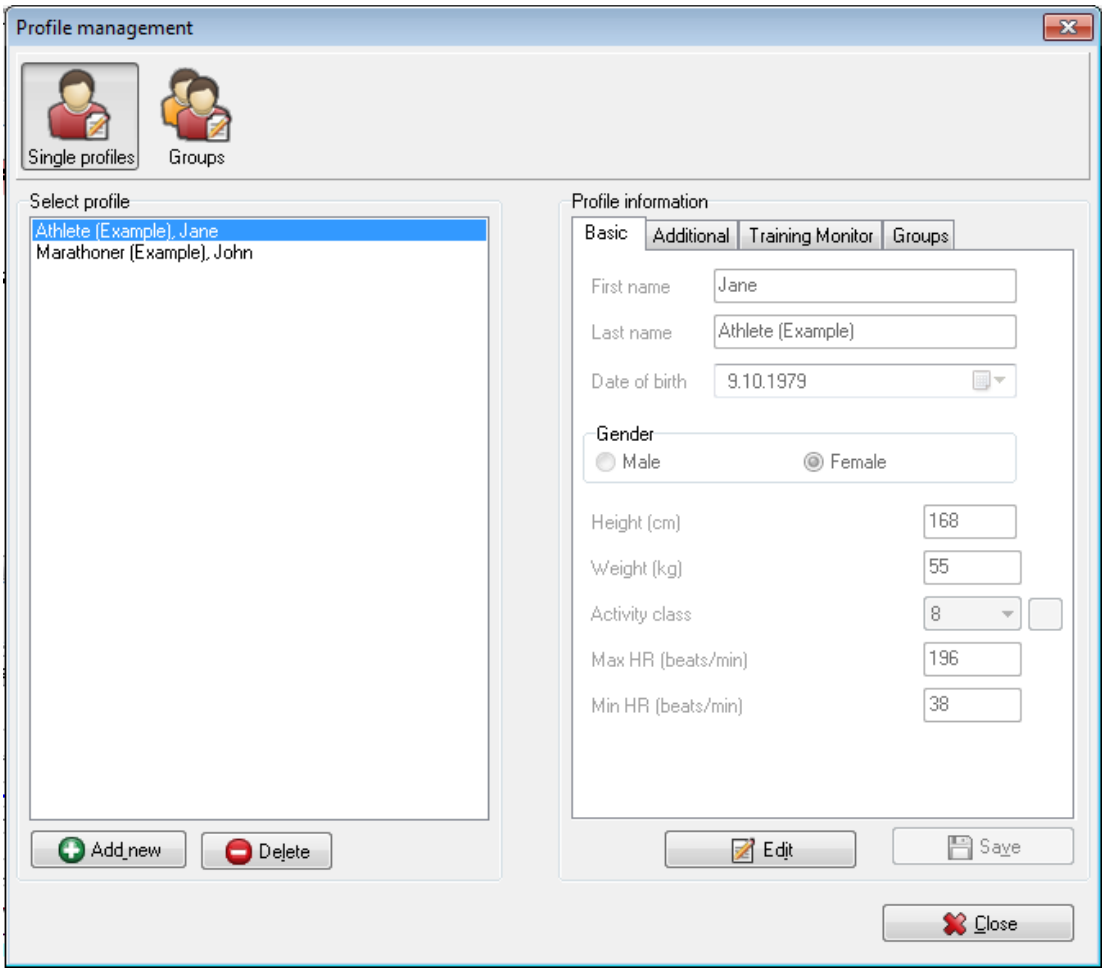


Figure 11. Profile and group management

With the profile and group management tool you can create, delete and edit user profiles and groups. The User profiles are necessary for loading the measurement periods to the program. New measurement periods will be loaded always for selected user profile and for the measurement period analysis the program always use the individual background information of the user profile. By creating groups is possible to monitor training load and recovery in group level via group reports, dashboard and during training monitor.

Open the profile and group management by clicking the profile and group management icon.

CREATE NEW USER PROFILE

1. Click ”Add new” button to add a new profile to the software.

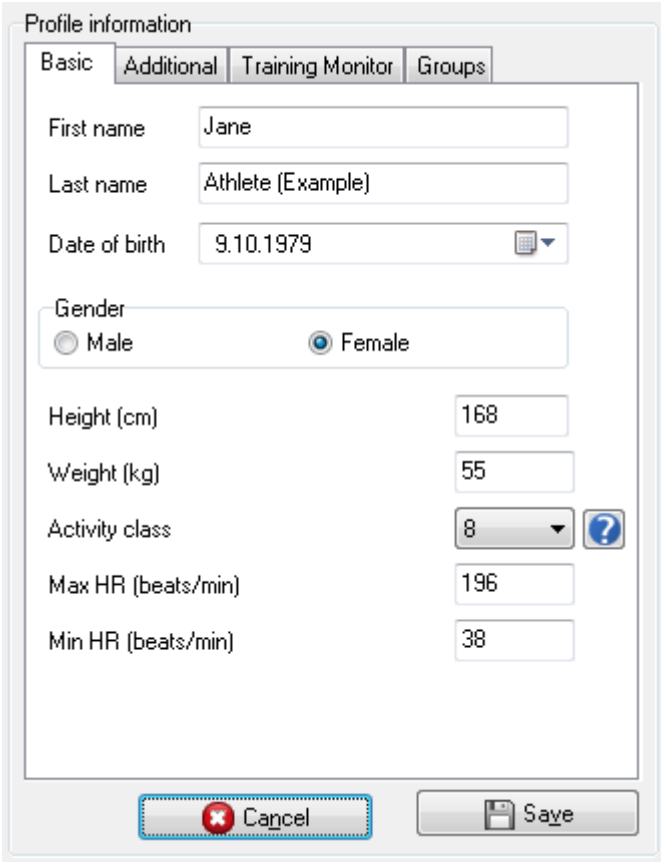


Figure 12. Profile background information

2. Fill in the user profile background information
   One profile refers always to one person and consists of information of that person’s personal attributes. Basic information is necessary for performing analysis. The basic information – such as age, weight, height and activity class affect the estimates and reactions of various physiological variables. More accurate profile information means more accurate analysis results.

   Required profile information includes:
   - First name
   - Last name
   - Date of birth
   - Language
   - Gender
   - Height
   - Weight
   - Activity class

3. At this point you can save the user profile by clicking the ’Save’, or continue to define additinal information of the user profile.

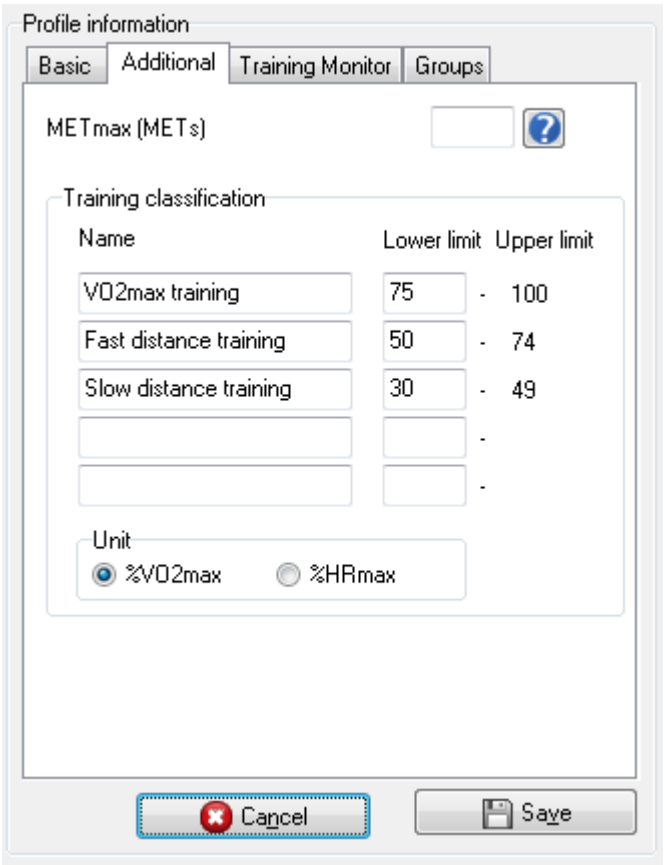


Figure 13. Additional profile background information

Additional profile information increases the accuracy of analysis. In case some personal values are unknown, leave the fields empty. The program has default reference values based on compulsory profile information which are used in absence of additional profile information.

Additional profile information includes:

- Maximum Heart Rate (beats/min)
- Minimum Heart Rate (beats/min)
- METmax (METs) (Oxygen intake measure)
- Training endurance classes up to five limits
- Training classification unit: %VO_2max or %HR_{max}

4. Define the individual training monitor settings (Optional).

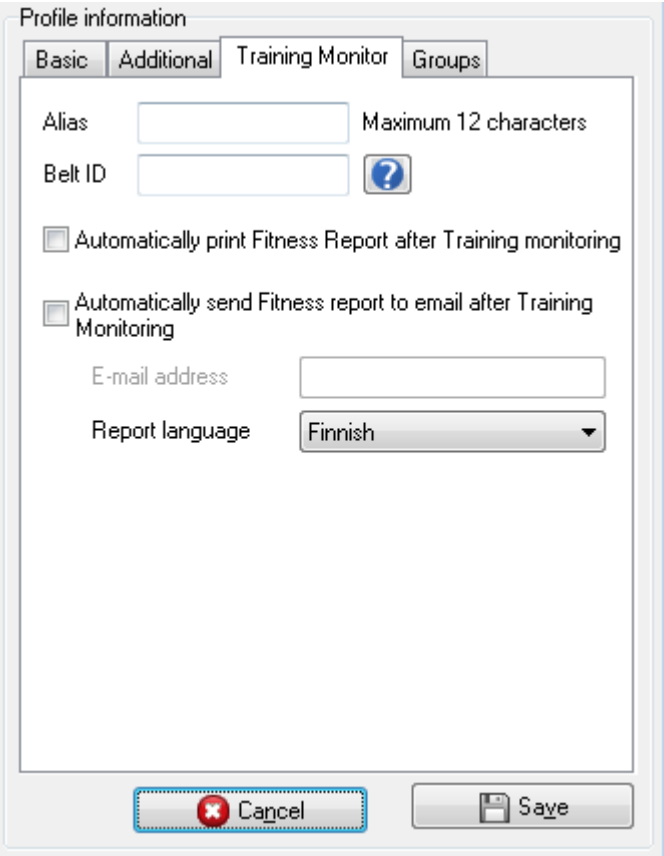


Figure 14. Profile training monitor settings

Also personal training monitor information and groups to which person belongs can be managed in profile management window.

Training monitor profile information includes:

- Alias name (shown as default in Training Monitor)
- Belt ID (can be used for Firstbeat and Suunto belts to pair the profile with belts)
- Automatic reporting after Training Monitor session is completed
- Automatic report e-mailing after Training Monitor session is completed
- E-mail address
- Report language

NOTE!
More information on determining MET-oxygen intake and activity class can be found at Help menu.

5. When you are defined all the user information which you want for the user profile click '*Save*'.

DELETE USER PROFILE

You can delete the user profile which you want by selecting the profile from list and by clicking the '*Delete*'.

Note!
Deleting a profile also deletes all of the profile's measurements in the database. The created PDF reports and heart rate data files will not be removed.

CHANGE USER PROFILE

Pressing '*Change Profile'* button opens list of available profiles.

1. Open the list by pressing button 'Change Profile'.
2. Click on the name of preferred profile or filter profiles by name or group and then click on the name of preferred profile.
3. The measurement view updates the display with the selected profile's information, measurements and the information of active measurement.

PROFILE CHANGE HISTORY

The changes and updates to profile information are listed on the Profile change history. The Profile change history is placed under the heading '*View*' in the main menu.

Information in the profile change history:

- Time (date and time when the change took place)
- Attribute (what variable was changed)
- Old value (the variable value before the change)
- New value (the variable value after the change)
- Event (the source of the change: a manual profile modification or an update based on an analysis)
- Measurement (start time of the measurement if an analysis was the source of change)

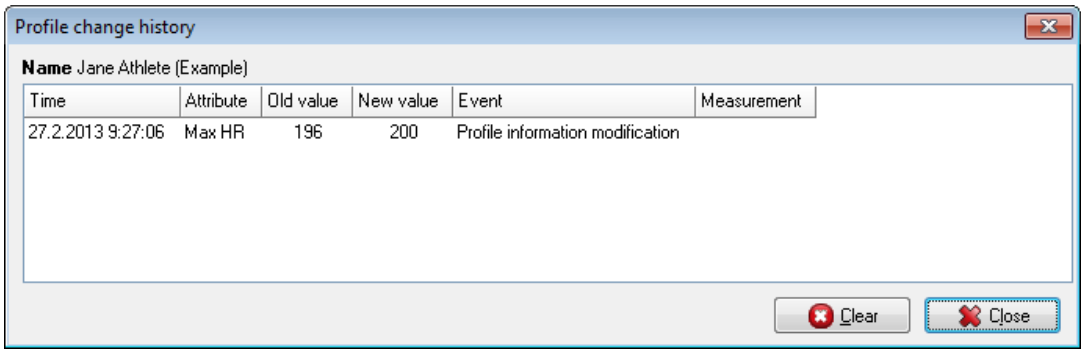


Figure 15. Profile change history

CREATE NEW GROUP

Create groups when you want to analyze training load and recovery also in group level.

1. Click '*Profile and Group Management*' and select 'Groups' – tab.
2. Select '*Add new*'
3. Set group name
4. Select user profiles to groups from other profiles list and click '*Add'.*
5. When you have selected profiles to the group click '*Save*'.

EDIT OR DELETE GROUP

You can edit selected group by selecting the group from the list and by clicking the '*Edit*'. When group editing is ready remember to click '*Save*'

You can delete group by selecting the group from the list and clicking '*Delete*'

NOTE!
Deleting group doesn't delete user profiles or any reports which belongs to the select groups.

LOAD MEASUREMENTS

This chapter provides information on how to load RR-I (Beat-by-beat) stored measurements to the Firstbeat SPORTS software from the following heart rate monitors:

Load measurements from Firstbeat and Suunto devices
Load measurements from Garmin device
Load measurements from Polar devices
Load measurement settings

NOTE!
When loading measurements from the supported measurement device the device drivers should be installed correctly. At default Firstbeat SPORTS software installation program installs Suunto and Firstbeat device drivers automatically during the installation process. Device drivers for other measurement devices are normally delivered with the device. Instruction for installing device drivers you will find from your device user guide.

LOAD MEASUREMENTS FROM FIRSTBEAT AND SUUNTO DEVICES

1. Select "File" - '*Load R-R file'*
2. In opening dialog, select whether to load a file or load the data directly from Firstbeat Bodyguard, Suunto t6, Suunto Memory Belt.
3. When loading the files, the system will automatically detect the type of the measurement (exercise and/or night recording).
4. Press '*Close*' to exit the R-R file loading tool. If you want to analyse loaded R-R files, press '*Analyse*'.

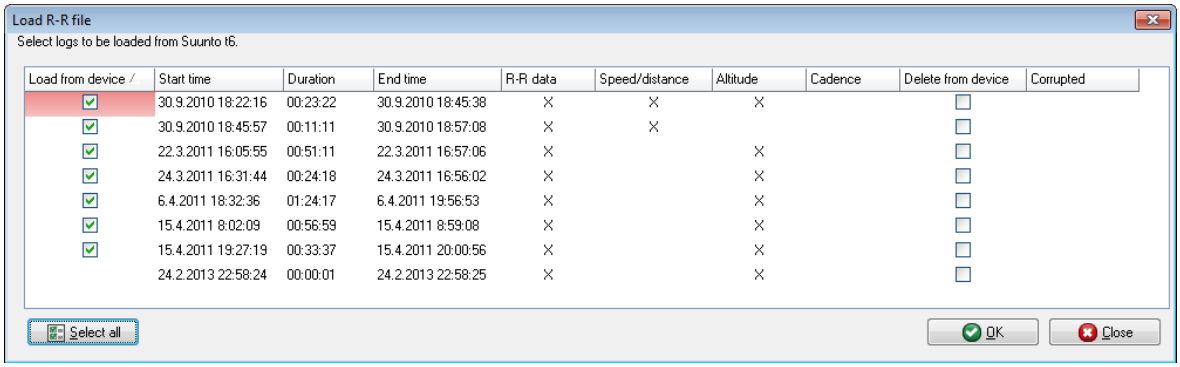


Figure 16. Load measurements dialog

Measurement devices might sometimes have had interruptions in recording which appears as multiple short measurements when loading measurements from the device. If such measurements are loaded from device, the measurement merging tool opens, it can be seen in below.

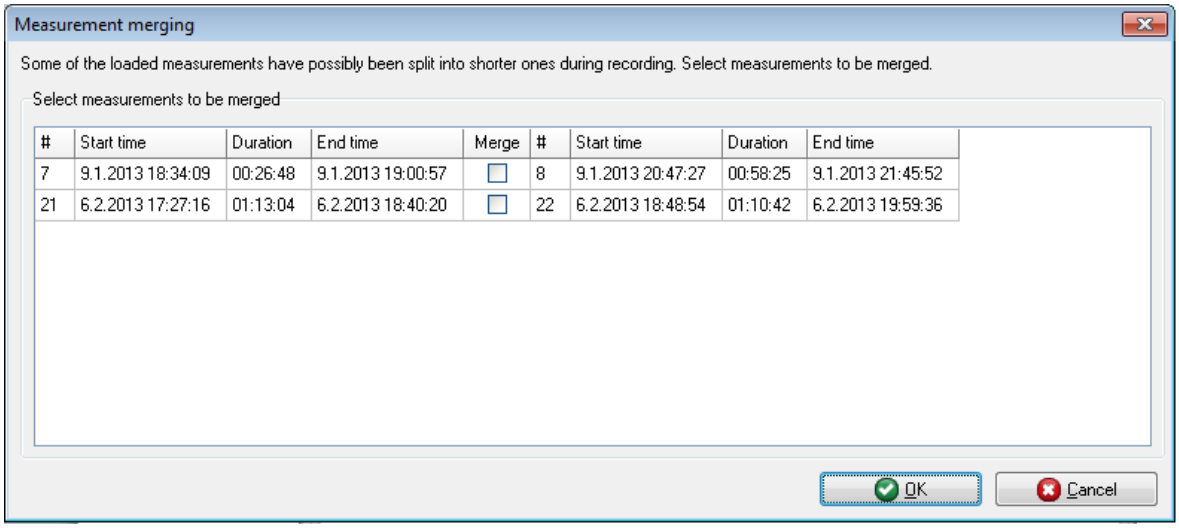

Measurement merging
Some of the loaded measurements have possibly been split into shorter ones during recording. Select measurements to be merged.
Select measurements to be merged
Start time Duration End time Merge # Start time Duration End time
7 9.1.2013 18:34:09 00:26:48 9.1.2013 19:00:57 8 9.1.2013 20:47:27 00:58:25 9.1.2013 21:45:52
21 6.2.2013 17:27:16 01:13:04 6.2.2013 18:40:20 22 6.2.2013 18:48:54 01:10:42 6.2.2013 19:59:36
OK
Cancel

Figure 17. Measurement merging

The tool opens if it's enabled in Options dialog and at least two measurement's start and end times are closer than the time period defined in Options dialog.
Select the measurements wanted to be merged by checking them on the '*Merge*' column. Click '*OK*' to close the dialog and have the selected merging done or close the dialog with '*Cancel*' with no modifications.

The following information can be entered for new measurements when loading measurement files:

- Measurement type
  - New measurements automatically receive status of night measurement if they match the night measurement criteria given in Options dialog)
- Time zone
  - Chances the start time of the measurement

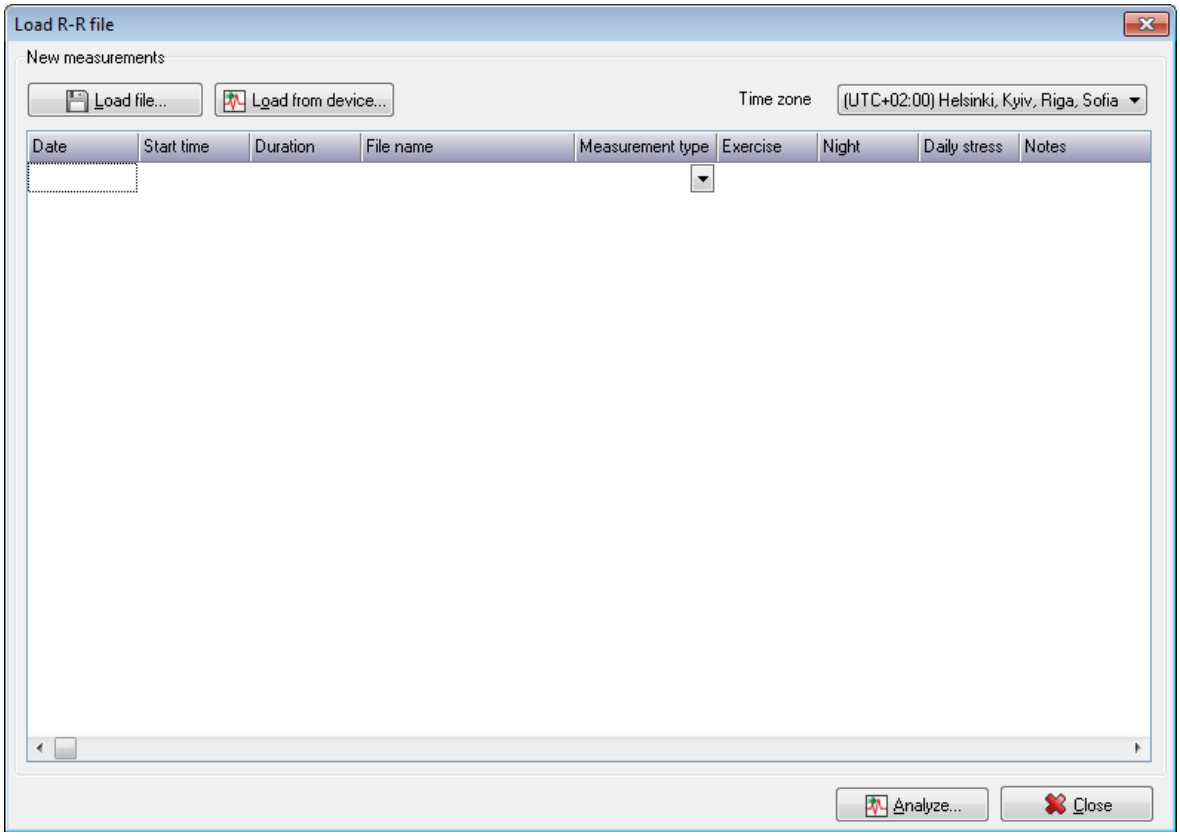


Figure 18. In the load R-R file dialog, information regarding measurements can be specified

If the lowest heart rate in analyzed measurement goes under the value in profile information, the analysis uses the new found lower value. Otherwise the value specified in profile information is used. The same applies to the maximum heart rate. After the analysis the application suggests the new values for max and/or min HR in profile information.
Measurement's information can be modified after analysis. Editing of some of the information will cause the measurement to become outdated and require reanalysis. Such information is:

- Personal parameters during the measurement

When saving modifications to the personal parameters during the measurement, the application starts the reanalysis automatically. If this reanalysis is aborted, the state of the measurement becomes outdated. The measurement has to be reanalyzed before new reports can be created out of it.

LOAD MEASUREMENTS FROM GARMIN DEVICE

AUTOMATIC GARMIN FILE LOAD

Loading measurement periods from the Garmin Forerunner 910XT and 610 measurement devices can be automatized. See further instructions in Garmin device settings chapter.

1. After pairing the Garmin device with the profile and setting R-R recording on (See chapter 1.3.6.3) all the new measurements is loaded to SPORTS on startup from the Garmin device folder. This operation is done only if new measurements are first loaded from the device to the Garmin Ant Agent and the setting '*Search new Garmin measurements when program starts'* is selected.

2. Automatically loaded measurement files should be analysed before viewing the results of the measurement periods.

LOAD GARMIN MEASUREMENTS MANUALLY

Garmin measurement periods (.FIT files) can be loaded also manually to Firstbeat SPORTS. Select '*Load measurements*' → '*Load from hard drive*'. You will find the Garmin files normally from the Garmin device folder. C:\Users\(User name)\AppData\Roaming\GARMIN\Devices\(Device ID)\Activities. At default that folder is hidden folder. Instructions how to view hidden folders you can find from your Windows operating system manual.

LOAD MEASUREMENTS FROM POLAR DEVICE

1. Select "File" - '*Load R-R file'*
2. In opening dialog, select load from Polar (s810, RS800, RS800CX or CS600).
3. When loading the files, the system will automatically detect the type of the measurement (exercise and/or night recording).
4. Press '*Close*' to exit the R-R file loading tool. If you want to analyse loaded R-R files, press '*Analyse*'.

Loading measurement from Polar S810, RS800 or RS800CX requires infrared device. Optionally computers own IR-receiver or IR-receiver either in USB or COM port can be used. Polar IR-receiver connected to COM port works only with Polar S810.

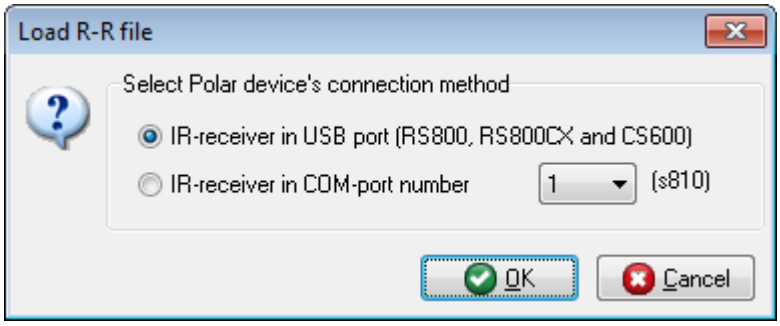


Figure 19. Select Polar device's connection method

Polar device has to be approximately 2 cm away from the receiver in order to connection to be successful. First set the Polar device to connection mode (for more information, see the Polar User manual). Then place the device in front of the IR receiver. An icon illustrating found Polar device will appear to the Windows notification area of taskbar when connection is successful. Then press „Ok" to start the transmission. A measurement selection dialog will open. Select the wanted measurement and press *'OK*'.

LOAD MEASUREMENT SETTINGS

You can edit Load RR-file settings in Tools > Settings > *HR Data* > *Load RR-file.*

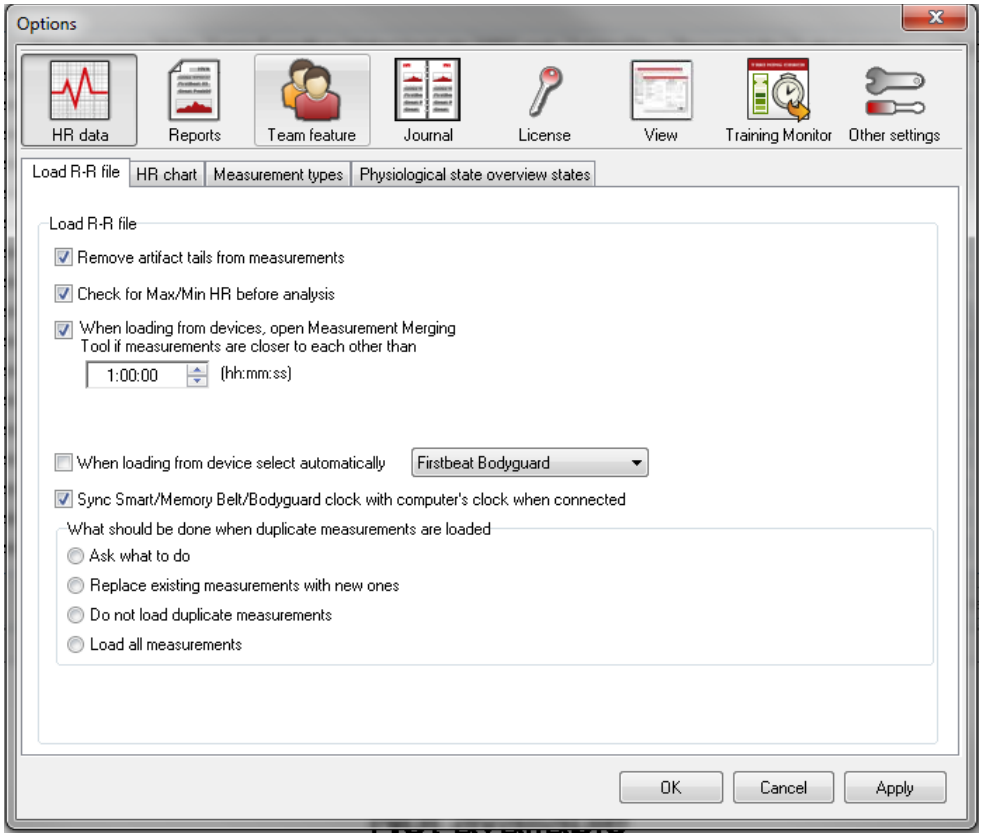


Figure 20. Load RR-file settings

Remove artifact tails from measurements: As a default the artifact tails are removed from the measurements. The artifact tail occurs normally when the heart rate belt is taken off before stopping the recording.

Check for Max/Min HR before analysis: As a default this feature is selected. This feature helps the user to analyze the recrdings with the corerct background information (e.g. when creating the person profile Max/Min HR values are not known)

Merging tool: If there are breaks in measurements (e.g. taking a shower and then continuing recordings) the recorded data will be merged into a one file if the end and start times of two consecutive recordings are closer than the set time.

DEVICE SETTINGS

This chapter provides you information on what settings can be modified in your recording device.

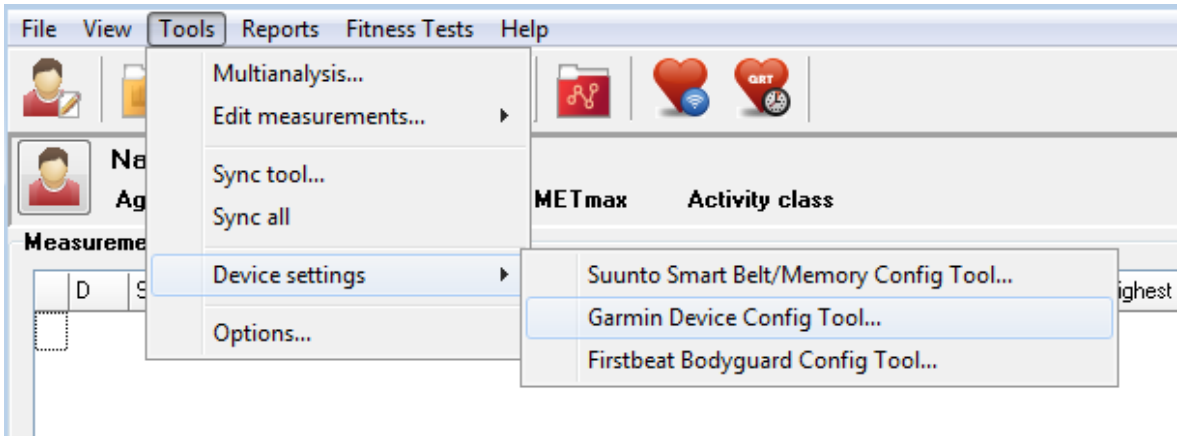


Figure 201. Device setting you will find from the tools menu.

FIRSTBEAT BODYGUARD SETTINGS

The following options can be configured for Firstbeat BODYGUARD device:

- Synchronizing Bodyguard internal clock to PC's clock (manually or automatically when Bodyguard is connected)
- Turning Bodyguard voltage alarm on/off
- Turning Bodyguard memory level alarm on/off
- Battery voltage warning limit percentage (warning is given, when battery voltage is below this limit)
- Memory full warning limit percentage (warning is given, when free memory is below this limit)
- Time when Bodyguard is shut down when it is not measuring
- Identifier string for the Bodyguard
- Time zone for the Bodyguard

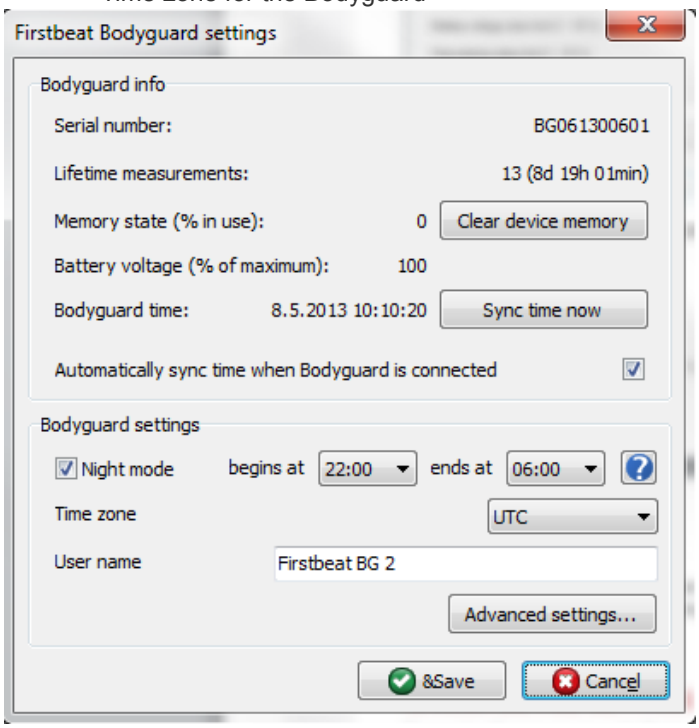


Figure 212. Firstbeat Bodyguard settings

Synchronize the Bodyguard's internal clock to PC's date and time by pressing button '*Sync time now*'. Save the new configuration by pressing button 'Save' or close the tool with button '*Cancel*'.

GARMIN DEVICE SETTINGS

To use the Garmin device with Firstbeat SPORTS the user must set the device's R-R recording on by using the program's setting tool. Firstbeat SPORTS creates a setting file that is sent to the device the next time it is connected to the Garmin ANT Agent -> The setting is changed only through this process.

Garmin ANT Agent version 2.3 or newer is required for turning on the R-R recording. See http://www.garmin.com/support for the latest version. The setting tool also enables user to pair the device with a certain profile so that all the new unloaded measurements can be loaded on every startup. Check the Device ID from the device settings (Menu->Setup->System->About->Unit ID).

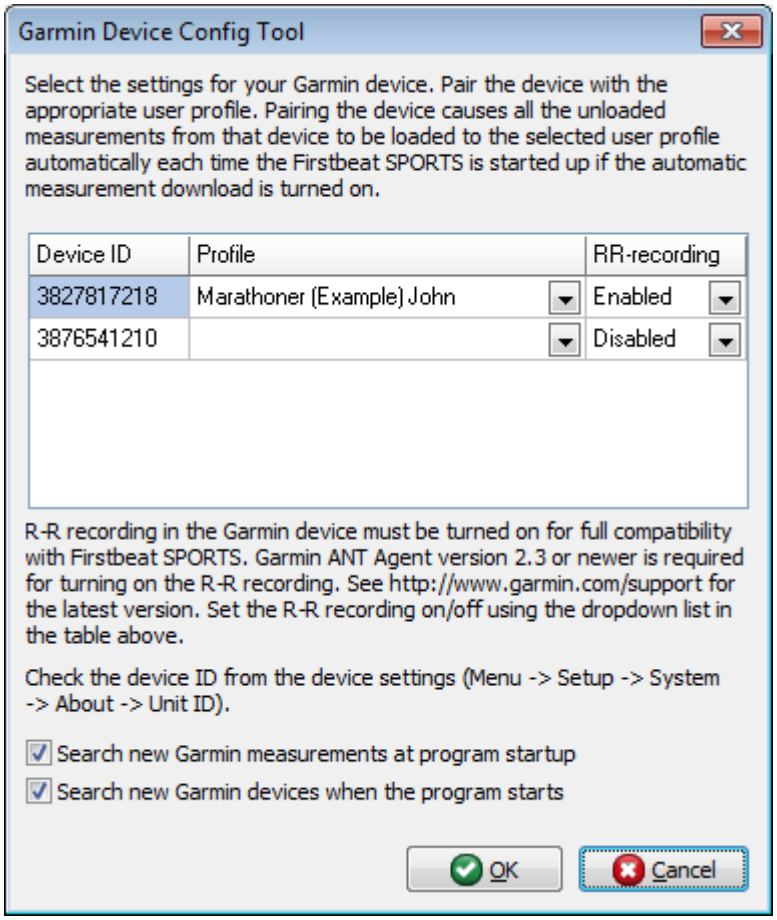

Garmin Device Config Tool
Select the settings for your Garmin device. Pair the device with the appropriate user profile. Pairing the device causes all the unloaded measurements from that device to be loaded to the selected user profile automatically each time the Firstbeat SPORTS is started up if the automatic measurement download is turned on.
Device ID
Profile
RR-recording
3827817218
Marathoner (Example) John
Enabled
3876541210
Disabled
R-R recording in the Garmin device must be turned on for full compatibility with Firstbeat SPORTS. Garmin ANT Agent version 2.3 or newer is required for turning on the R-R recording. See http://www.garmin.com/support for the latest version. Set the R-R recording on/off using the dropdown list in the table above.
Check the device ID from the device settings (Menu -> Setup -> System -> About -> Unit ID).
Search new Garmin measurements at program startup
Search new Garmin devices when the program starts
OK
Cancel

Figure 22. Garmin device config tool

Select "*Tools*" →"*Device settings*"→ "*Garmin device config tool*"

1. Pair the device with a profile from drop down menu.
2. Turn R-R recording on from dropdown menu if you want to get full compatibility with Firstbeat SPORTS.
3. Click "Search new Garmin measurements at startup" checkbox below if you want set automatic Garmin measurement download on.
4. User can also click the checkbox below the device listing to prevent searching for new devices if they are installed later to Garmin ANT Agent.

5. Click ”OK“.

Now after making new settings, connect the device to Garmin ANT Agent. The settings are installed to the device.

SUUNTO DEVICE SETTINGS

Suunto Smart/Memory Belt Config Tool offers means to configure the Suunto Smart/Memory Belt. Following options can be configured:

- Synchronizing belt internal clock to PC’s clock (manually or automatically when belt is connected)
- Turning belt tones on/off
- Turning radio transmission on/off (turning the radio transmission off saves the battery)
- Turning R-R recording on/off
- Memory full warning limit percentage (warning is given, when free memory is below this limit)
- Number of free logs low warning limit (warning is given, when number of free logs is below this limit)
- Identifier string for the belt

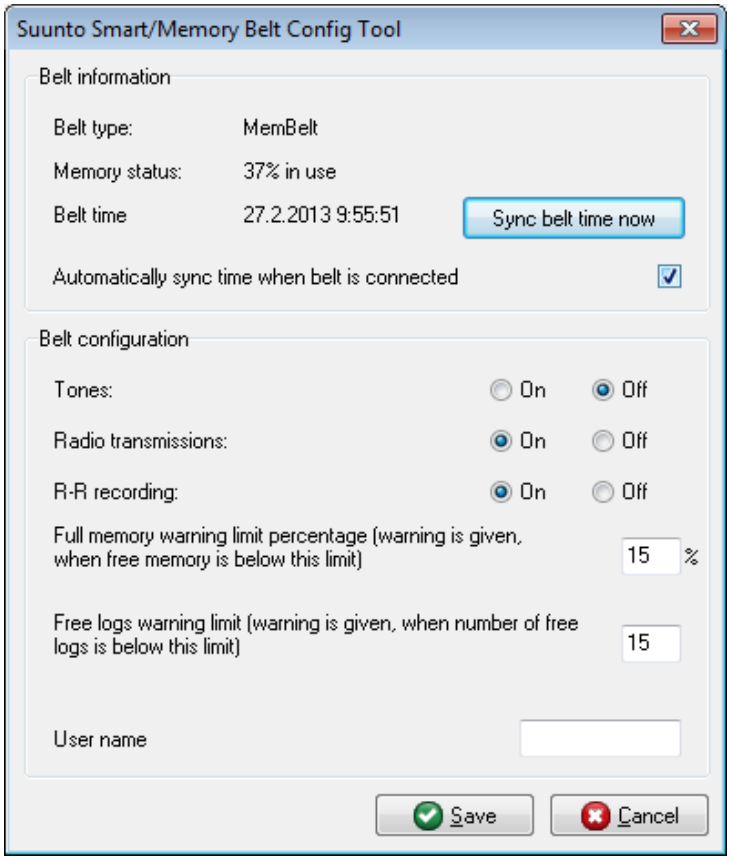


Figure 23. Suunto memory belt config tool

Synchronize the belt’s internal clock to PC’s date and time by pressing button ‘Sync belt time now’.

Save the new configuration by pressing button ‘*Save’* or close the tool with button ‘*Cancel*’.

EDIT MEASUREMENTS

This chapter provides you information on how to edit measurements and measurement background information.

Measurements can be edited either by merging or splitting them, adding lap/journal markers to them or specifying sleep periods in them. It can be made from the tools menu but the tool can also be invoked by pressing the right mouse button on the top of the wanted measurement and selecting '*Edit measurement'* from the pop up menu.

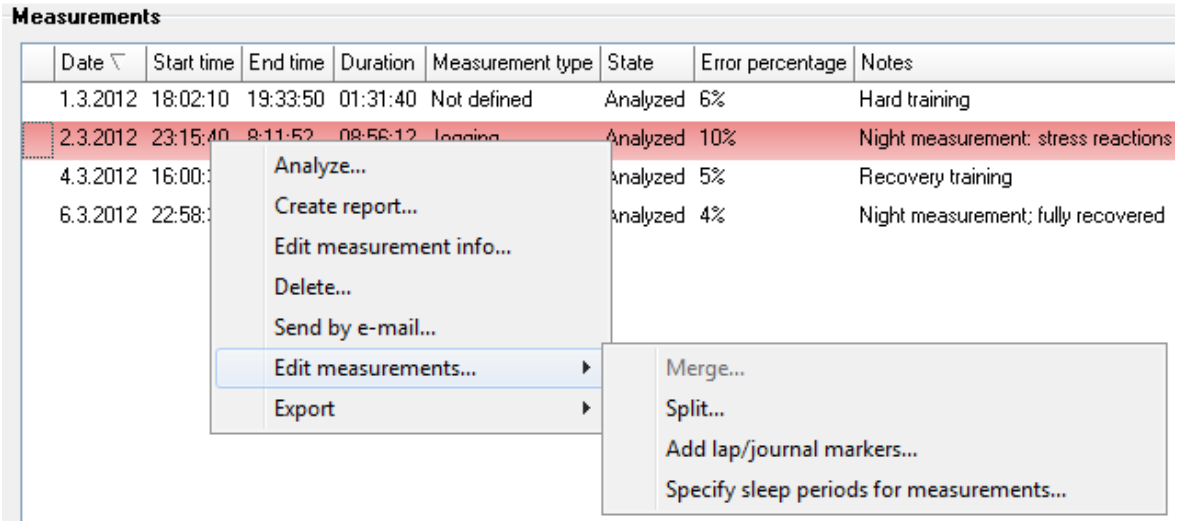


Figure 24. Tools for editing measurements founds also from pop-up menu

EDIT MEASUREMENT INFORMATION

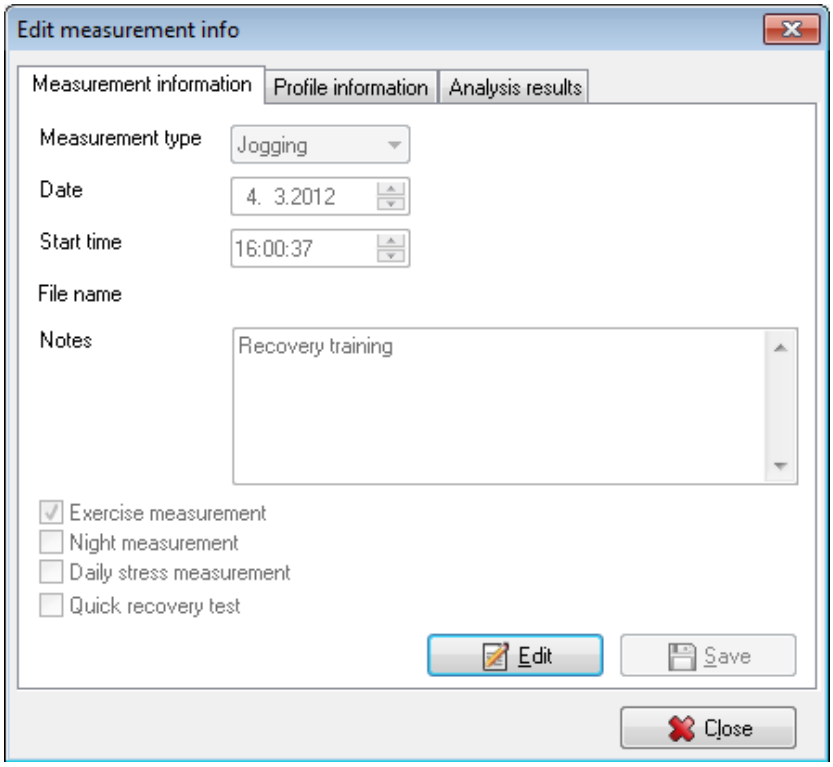


Figure 25. Edit measurement information

You can edit the selected measurements background information by clicking the right mouse button and selecting *'Edit measurement info'.*

From **measurement information** tab you will find the general information about the measurement period.

Measurement type helps you to identify the measurement from the measurement list. More measurement type can be created from the options: *'Tools' → 'Options' → 'HR data' → 'Measurement types'*

You can also edit the measurement date and start time and add notes for the measurement.

Marking Exercise measurement, Night measurement, Daily stress measurement and Quick recovery test are intended to define the measurement type for the follow-up charts and reports. With this selection the program can draw the training load and recovery follow-up charts.

From **profile information** tab you can find the info about person back ground information which are used to the analysis of the measurement period. After the changes a reanalysis of the measurement is required.

NOTE!
Editing measurement information at this view effects only to the selected measurements information and doesn't make change to the person background information. You can edit the person background information via profile and group management tool.

Analysis results tab provides the key results of the analysis

Hint:
You can edit several measurement period background information by keeping the Edit measurement info dialog open and by selecting the measurement period from the measurement table. You can also select several measurement periods at once by selecting measurement when keyboard CTRL button is pressed.

SPLIT MEASUREMENT

Any measurement shown at the measurements list can be split. Splitting is done by first activating the measurement by clicking it on the measurement list at the measurement view. Next start the splitting tool from the pop up menu or from the tools menu (‘Edit measurement’ → ‘Split’).

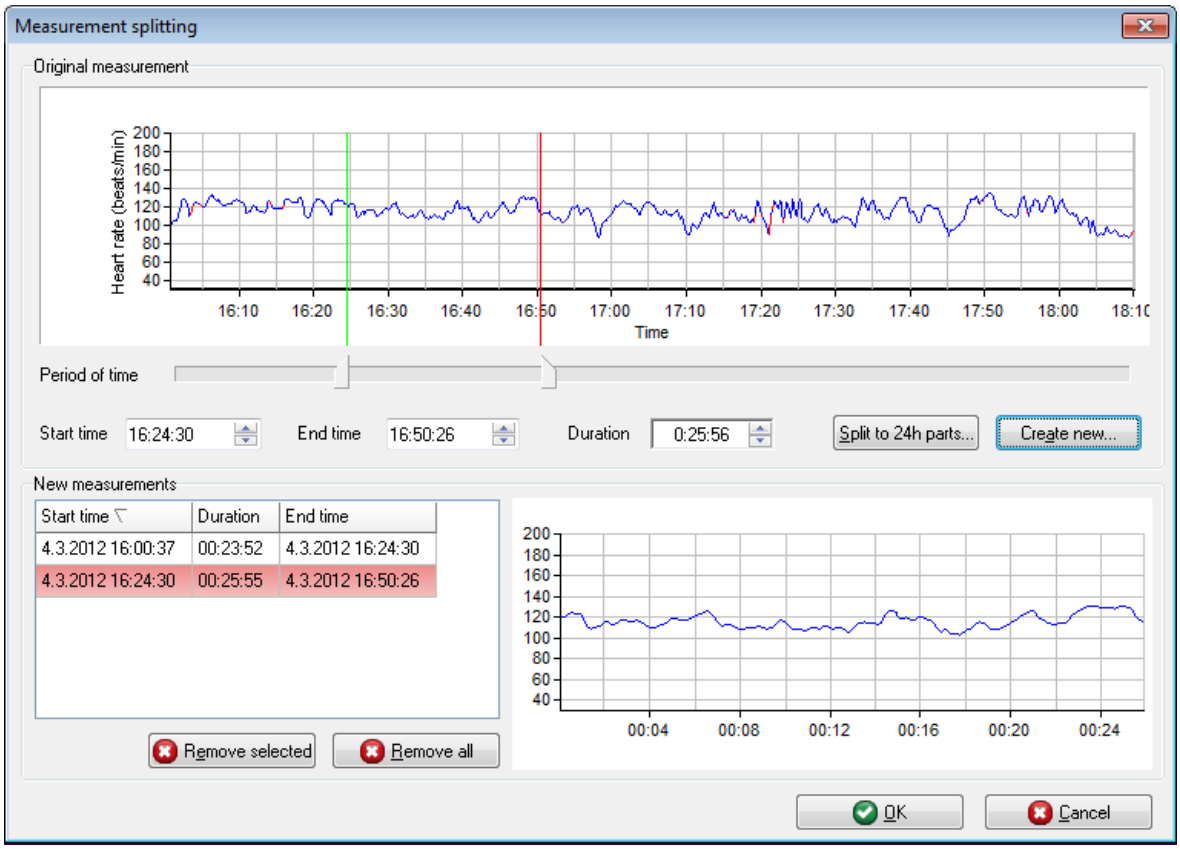


Figure 26. Measurement splitting tool

At the top of the splitting tool the original measurement is shown. There are two ways to define the wanted split, either with sliders or by defining the time. Sliders are simply moved to the start and to the end point of the wanted area. Another way is to directly type the wanted time period to the time boxes.

After selecting is made press ‘Create new’ to split the measurement.

At the lower ‘New measurements’ box the information of the split sections is shown. At the lower left side can be seen the start time, end time and the duration of the new created measurement and at the lower right side the draft of the new measurement.

The number of new measurements created from the original is not limited, but every new measurement has to be longer than two minutes.

If the measurement is longer than 24 hours it can be split into twelve hour section by pressing ‘Split to 24 hours parts.

MERGE MEASUREMENTS

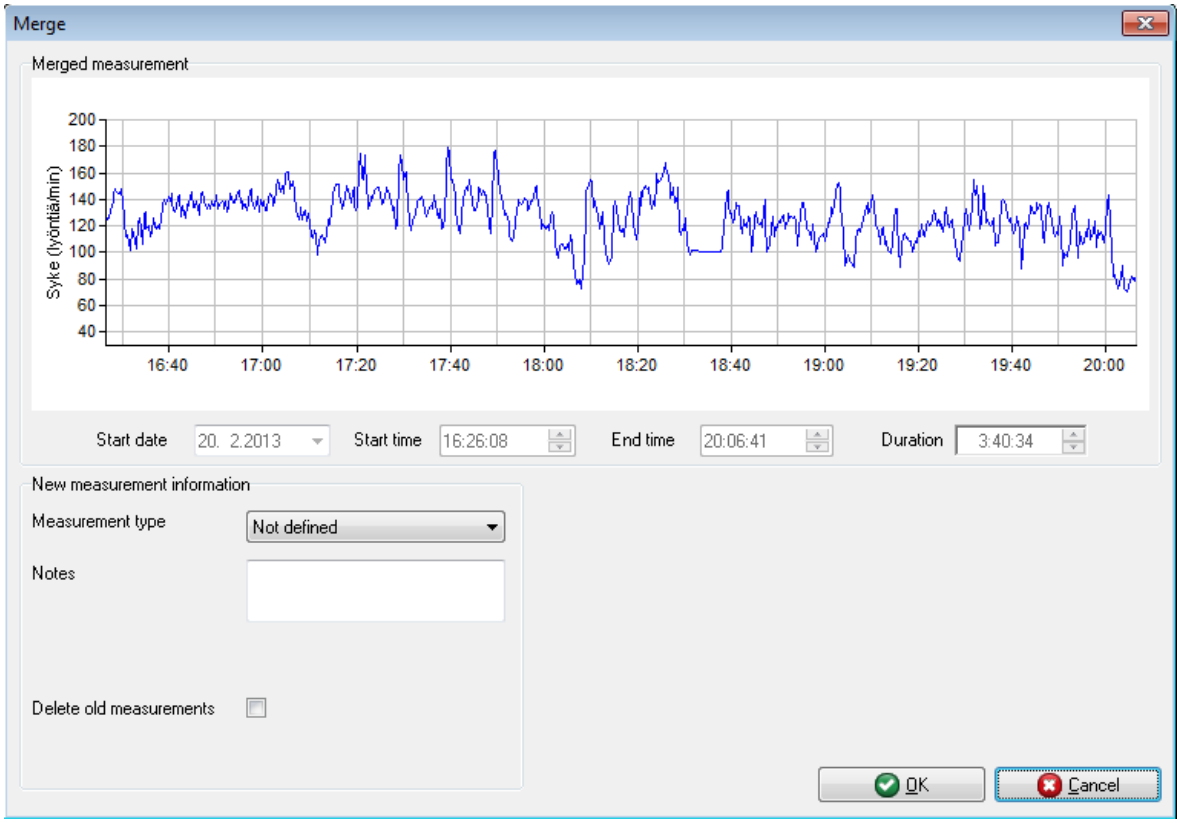


Figure 27.Measurement merging tool

Merging happens by choosing two measurements to be merged from the measurement list at measurement view. After selection press 'Merge' from the 'Edit measurement' options. At the merging dialog the program shows the draft of the new measurement. Measurement type and the notes can be defined at the merging tool.

If the merging is successfully done from the original two measurements, the merged measurements will be deleted from the measurement list.

Measurements cannot be merged if they are over 24h apart.

SPECIFY MEASUREMENT SLEEP PERIOD

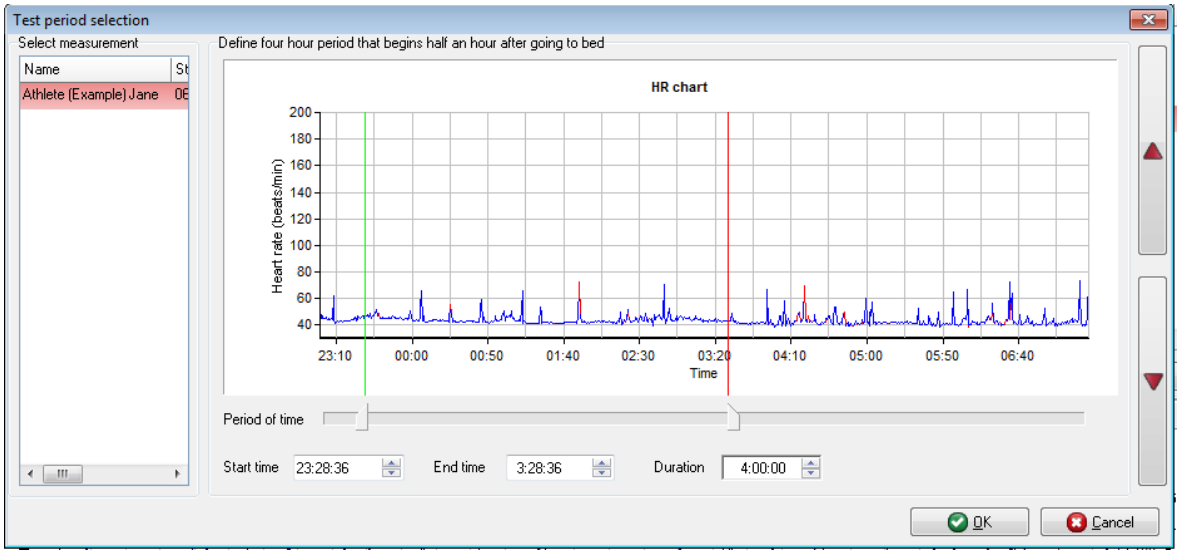


Figure 28. Specify sleep periods for measurements

Sleep period is defined to start automatically at 11 pm. 4 hours period from which the recovery index is calculated starts as a default 30 min after set time. If the measurement starts after the set sleeping time, sleep period is set to start 30min after the beginning of the measurement.

You can redefine time when the sleep time starts from options:

1. Click from upper menu bar '*Tools*'→'*Options*'
2. Select '*Journal*' and then you can redefine time when the sleep period starts
3. You can set sleeping time also manually by click '*Tools*'→'*Specify sleep periods for the measurements'*

.

ADD LAP / JOURNAL MARKERS

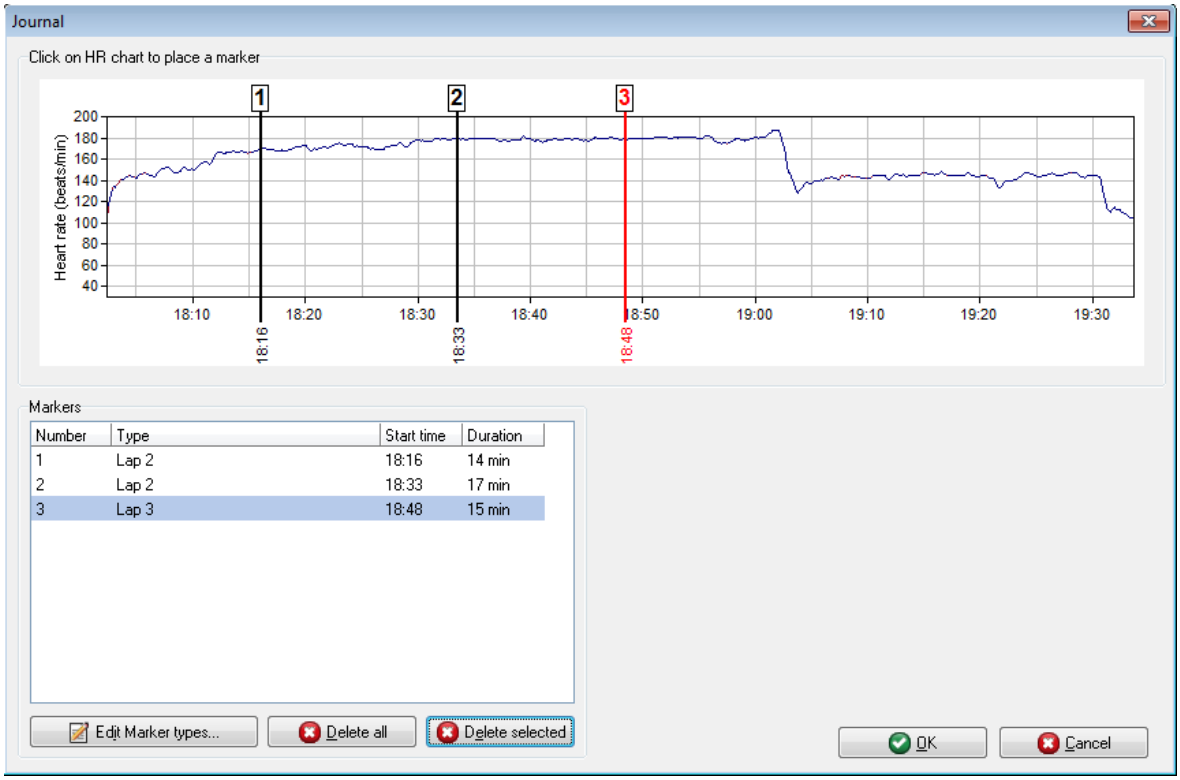


Figure 29. Add lap / journal markers tool

You can add lap and journal markers via '*Add lap/jurnal markers*' tool.

Open the lap/journal markers tool by selecting first measurement period from the measurements table and by clicking the second mouse button. Then select '*Edit measurements*' → ' *Add lap/ journal markers'.*

You can add the markers by clickign the section from chart via mouse and by selecting the marker which you want to add. If you donät have already created any markers you can create newe marker by selecting *'Add new marker type'.*

ANALYSE MEASUREMENTS

The measurements are required to be analyzed before viewing the results or printing the reports. The measurements can be analyzed one-by-one by pressing “Analyze” after selecting the measurement. Multiple measurements can be analyzed at once through Multi analysis tool.

ANALYSE MEASUREMENTS

Analyze the selected measurements by clicking the ‘*Analyze*’ button below the measurements table.

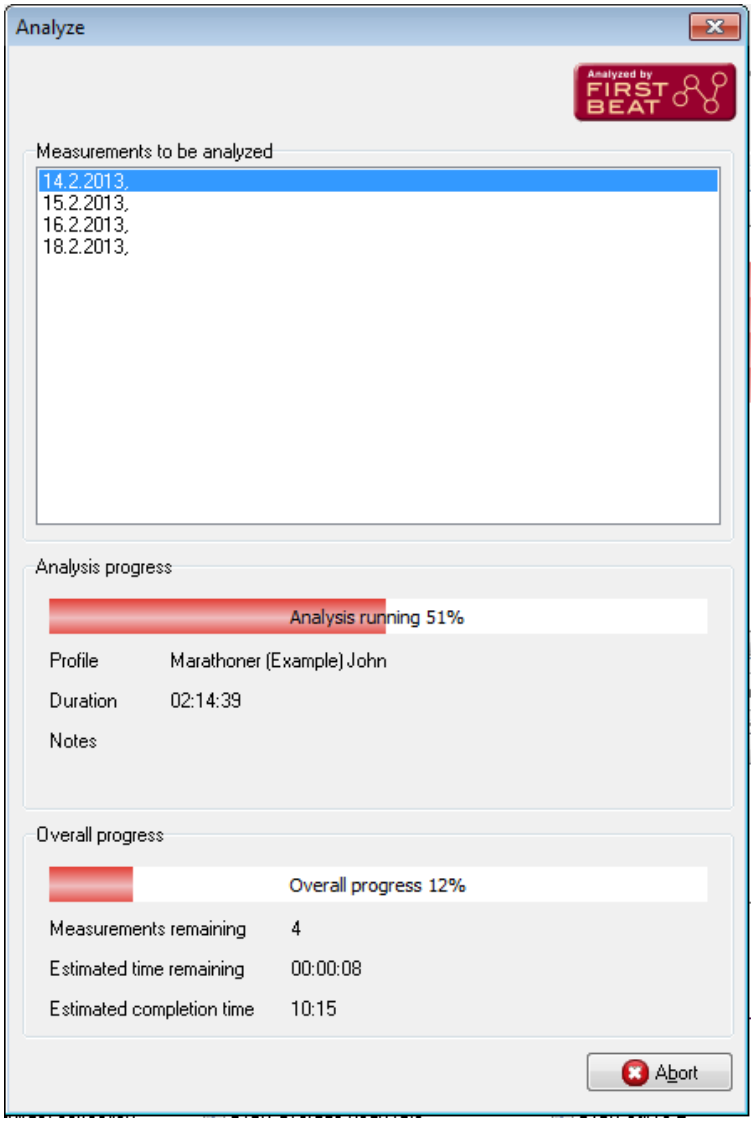


Figure 30. Measurements analysis

REANALYSE MEASUREMENTS

The measurement can be reanalysed if it is outdated or it has not been previously analysed. There are two ways to do the reanalysis:
Analysing single measurement:

1. Select the measurement from the list and press button ’*Analyze*’.

Analysing multiple measurements (profile level selection):

2. Open ”*Tools*” menu.

3. Select ”*Multianalysis*”.
4. Use filters for selecting the desired set of measurements to be analysed.
5. Press ”*Analyse*”.

MEASUREMENT EXPORT

This chapter provides information how to export measurements from the program in different file formats. Supported file formats are fbe, csv and gpx.

There are six ways of export, the Data export, the multi data export, the measurement export, the Master export, the profile export and the GPS export.

NOTE!
More information

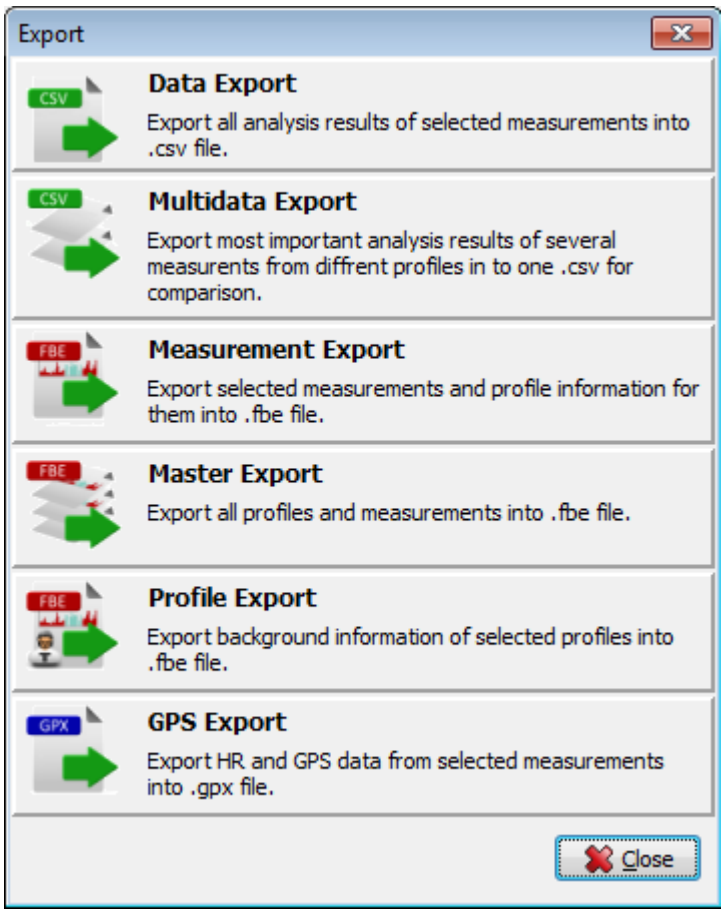

Export
Data Export
Export all analysis results of selected measurements into .csv file.
Multidata Export
Export most important analysis results of several measurents from diffrent profiles in to one .csv for comparison.
Measurement Export
Export selected measurements and profile information for them into .fbe file.
Master Export
Export all profiles and measurements into .fbe file.
Profile Export
Export background information of selected profiles into .fbe file.
GPS Export
Export HR and GPS data from selected measurements into .gpx file.
Close

Figure 31. Export menu

DATA EXPORT

With Data Export you can export all analysis result in scalar and vector state to .csv file. You can view the .csv file for example with Microsoft excel program.

NOTE!
More information about the variables you will find from the Help menu.

MULTI DATA EXPORT

With Multidata export you can export most important analysis result of several measurements from different profiles into one *.csv file for comparison. You can view the .csv file example with Microsoft excel program.

NOTE!
More information about the variables you will find from the Help menu.

MEASUREMENT EXPORT

With measurement export you can export selected profiles selected files to .fbe file. The .fbe suffix file can be imported to the Firstbeat SPORTS and ATHLETE programs.

MASTER EXPORT

With Master export you can export all profiles all measurement periods to the single .fbe suffix file. With this export you can example transfer all the measurement periods and profile information to the another SPORTS program or to the ATHLETE program.

NOTE!
Master export differs from the system backup with follows: System backup saves also the system settings and group information. Master export doesn't save the setting and group info to the fbe file. When import Master export file the program doesn't delete previous settings, profiles and measurements from the SPORTS like system restore.

PROFILE EXPORT

With profile export you can export selected person profiles profile information to the fbe file. With this feature you can transfer only person profile to another SPORTS program or to the ATHLETE program.

GPS EXPORT

The measurements which include the GPS data can be exported from the SPORTS to the GPX file. The.gps suffix file can be viewed with GPS viewing software example Google Earth. This way you can view the travelled route in map with the heart rate, speed and altitude information. Create GPS export by selecting the measurements to the export from the measurement table and by clicking the second mouse button over the measurements. Then select *'Export'* → *'GPS export'*.

IMPORT MEASUREMENTS

With import feature you can load the exported data to the Firstbeat SPORTS.

The exported data can be loaded to the program with the import tool. Pressing '*Import*' opens a folder selection. Simply choose the folder where the wanted data is and press '*Open*'.

NOTE!
Supported import file formats are .zip and .fbe.

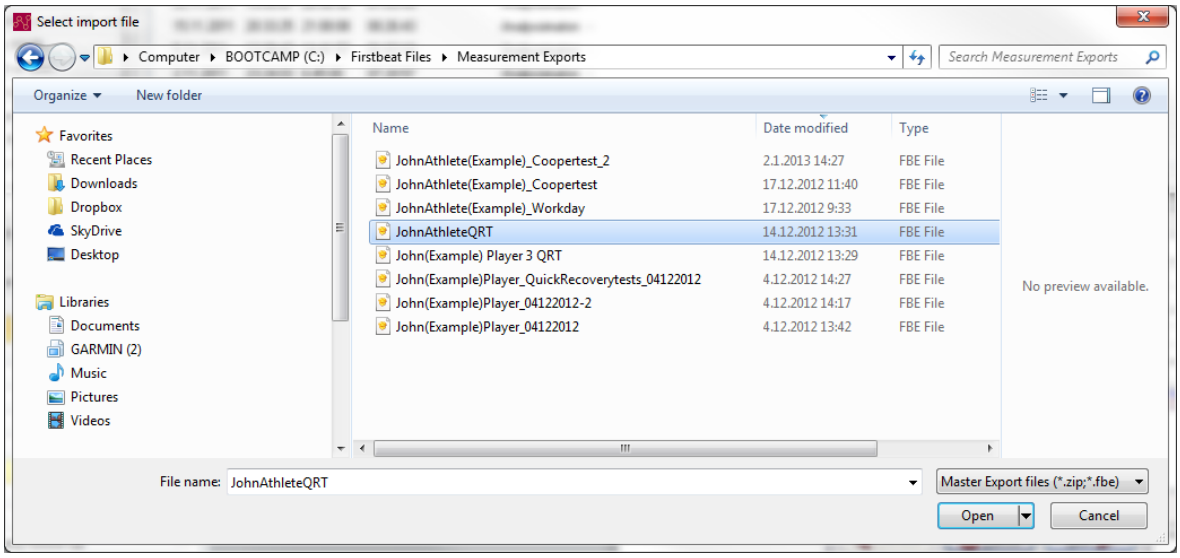


Figure 32. Import fbe measurements

IMPORT GPSPORTS XML FILE

By clicking 'File'→'Import'→'Import GPSports XML file' you can import XML files which are exported from the GPSports software. This feature allows you to import GPSports GPS data to SPORTS and attach that GPS data to corresponding heart rate measurement. To get more information about this feature please contact your Firstbeat SPORTS contact person.

INDIVIDUAL REPORTS

With the individual reports you can share the information about training sessions and recovery in many different languages.

Personal reports can be created as follows:

1. Select appropriate person profile.
2. Press 'Create report'.
3. Select measurements from which wanted to be created reports.
4. Select the reports wanted to be created.
5. Select curves to be shown (only Training Report)
6. Press 'Create reports…'
7. A file saving dialog opens, choose file name prefix and destination folder.
8. The reports open into the default .PDF viewer. If .PDF viewer is not in use, download and install one. Adobe Acrobat Reader is recommended.

NOTE!
The default folder for saving reports is: C:\Firstbeat Files\Profile name\Individual reports
The report saving folder can be changed in Options dialog's Other settings tab.

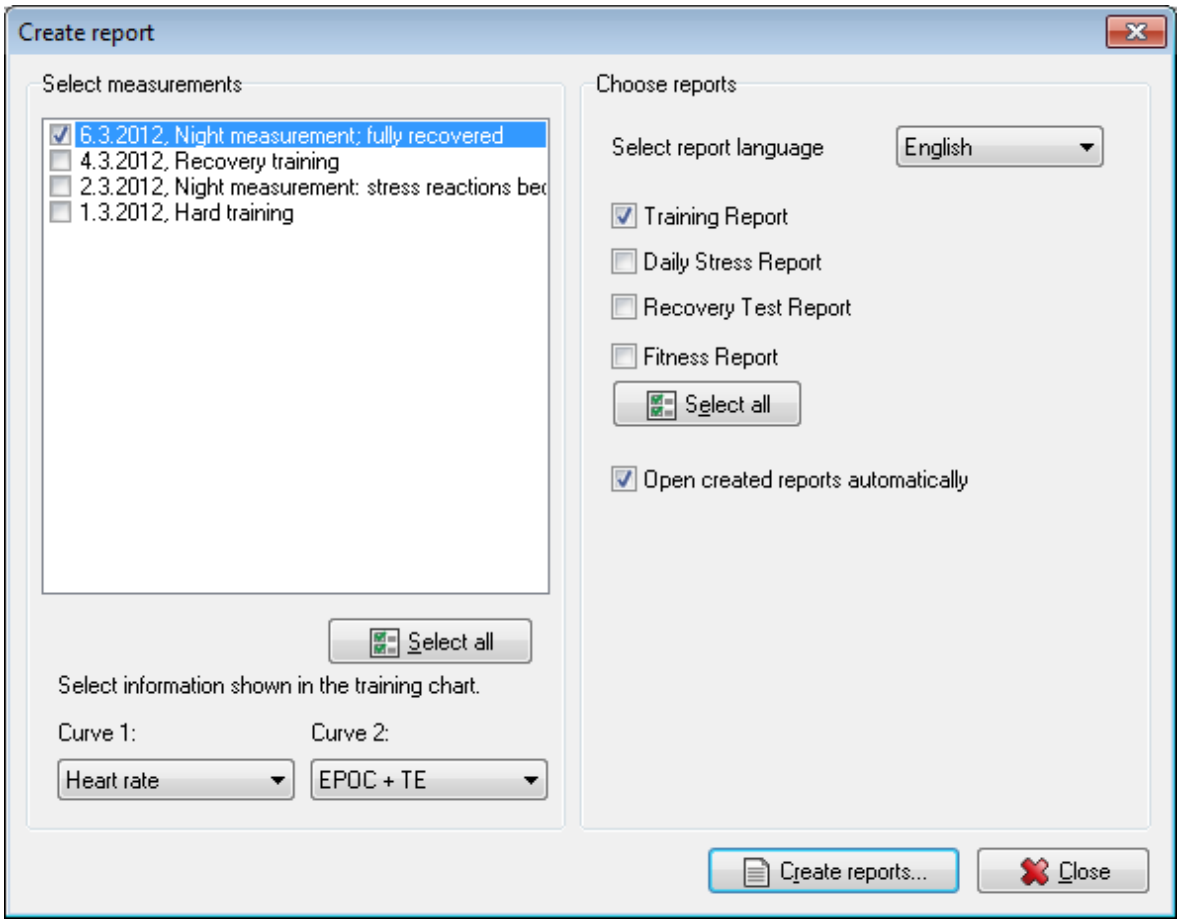


Figure 33. Create report dialog

Four different reports can be created: Training Report, Daily Stress Report, Recovery Test Report and Fitness Report.

Lap times from Garmin, Suunto and Polar devices are shown also in Training report in addition to measurement's view graphs and are loaded into journal.

Recovery Test Report focuses on the first four hours of sleep and can be only made from measurements with status of night measurement. Recovery test results are scaled individually based on measurement history. When creating the report at first time, program opens questionnaire dialog where subjective feeling and training load is asked. Query dialog is performed to calibrate recovery scale individually. After having adequate measurement history, the recovery scale is formed automatically.

Sleep period is defined to start automatically at 11 pm. Sleep time starts half an hour after set time if measurement starts before the set time. If measurement starts after the set time, sleep period is set to start half an hour after beginning of the measurement.

You can redefine time when the sleep time starts from options:

1. Click from upper menu bar '*Tools*' → '*Options*'
2. Select '*Journal*' and then you can redefine time when the sleep period starts

You can set sleeping time also manually by click '*Tools*' → '*Specify sleep periods for the measurements*'

GROUP REPORTS

This chapter provides you the information how to create group reports in different languages and what you should take into account when creating the group reports.

Group reports compare various exercise or recovery related properties between selected measurements such as EPOC, Training effect and Quick recovery test score.

CREATE TRAINING EFFECT GROUP REPORT

The Training Effect Group Report shows selected exercise related variable of each selected measurement. In case there was set target for variable, report shows that target to ease the recognition the diverging measurements more easily. Set the variable limits in the dialog shown below.

1. Select Training Effect Group Report from report settings, select language for reports and select exercise related variable for distribution.
2. Press '*Create reports*'
3. Select if you want to set target values for variable. Set target values and notes and press OK.
4. A file saving dialog opens, choose file name prefix and destination folder.

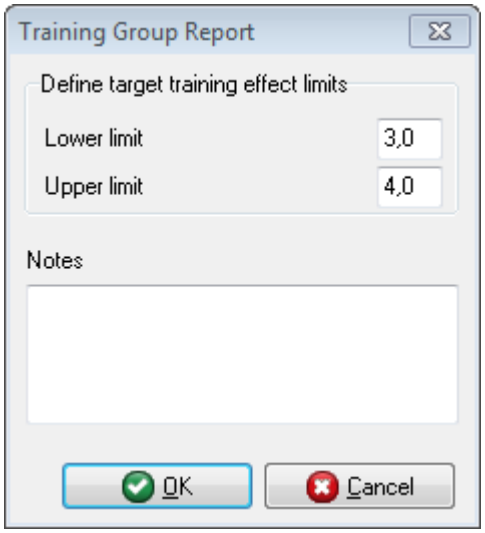


Figure 34. Define target training effect limits for training group report.

CREATE QUICK RECOVERY TEST GROUP REPORT

Quick Recovery Test Group Report shows recovery related variable of each selected measurement.

1. Select Quick Recovery Test Group Report from report settings and select language for report.
2. Press '*Create reports'*
3. Input notes for report and press '*OK*'.
4. A file saving dialog opens, choose file name prefix and destination folder.

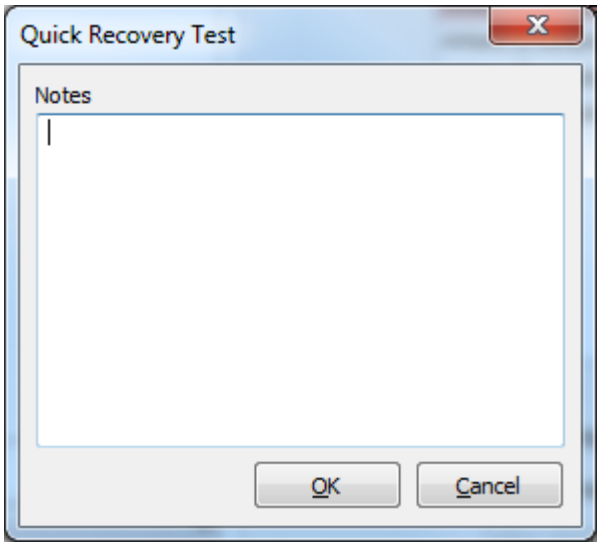


Figure 35. Setting notes for Quick recovery test report.

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FITNESS TEST REPORTS

From this chapter you will learn how to create the fitness test reports in different languages and with different fitness test protocols. Also information what you should take into account when creating these reports are provided.

The fitness test reports can be accessed from the Fitness Tests menu from the main toolbar. First select the type of the fitness test report wanted to be created.

There are six different types of fitness test reports available.

- Conconi
- Yo-Yo
- Maximaalinen kuntotesti
- Submaximaalinen kuntotestitesti
- UKK-kävelytesti
- Cooperin testi

The fitness test reports each have varying wizards with which they are specified. But they all share two steps: selecting measurements and time period.

The first step in all fitness test reports is to select the measurements of which fitness test reports are to be created. It is visible after selecting the appropriate type of fitness test report. It can be seen in the illustration below.

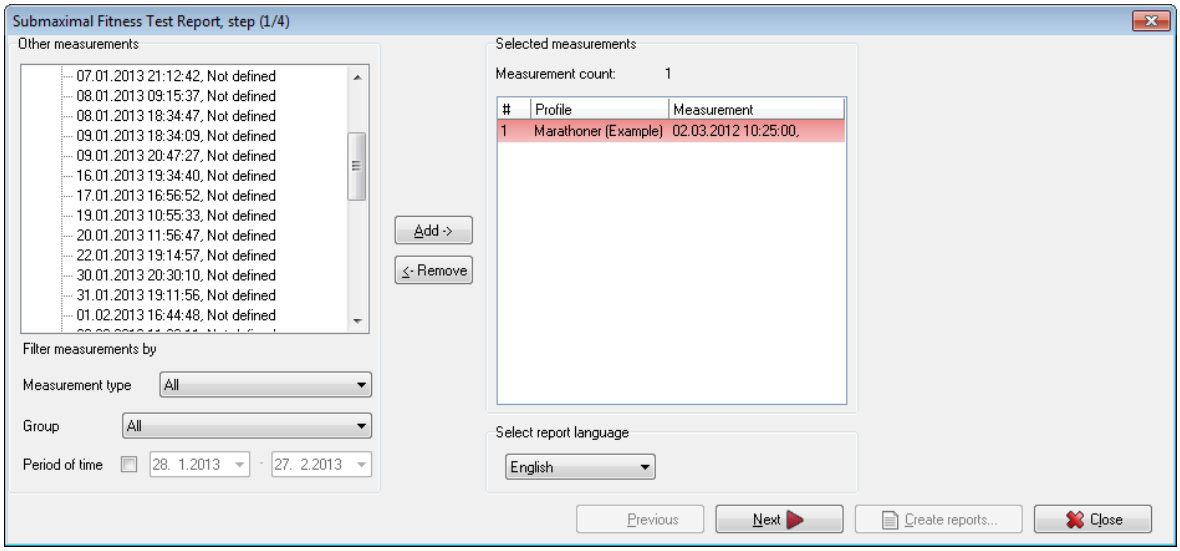

Figure 36. Select measurements to fitness test

In the first step, select measurements of which wished to generate fitness test reports from. All analyzed measurements are listed on tree view on the left. They can be filtered by selecting specific group and by specifying period of time to show only measurements from desired period.

Select measurements from the tree view and click button ‘Add’, or double click the measurements. The table on right displays the selected measurements. Measurements can be removed from the table by selecting them and clicking button ‘Remove’ or double clicking them.

The steps to follow after first are explained in the following chapters for each fitness test report.

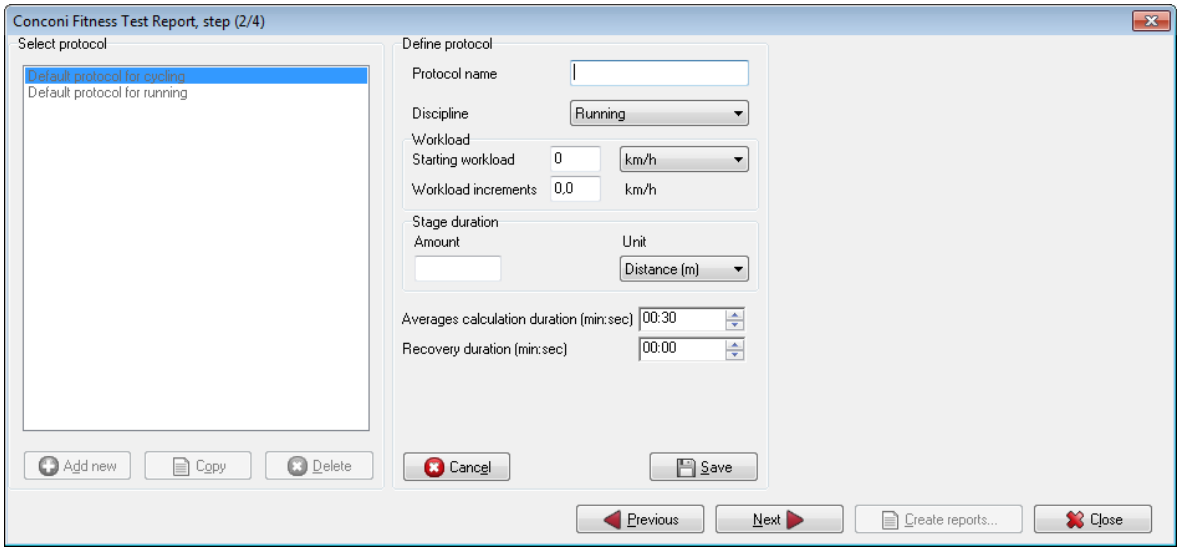

Figure 37. Protocol definition for Conconi fitness test report.

After selecting the measurements, Conconi fitness test report wizard has protocol specification step. There are default protocols for running and bicycling or a new one can be made.

If a new protocol is chosen to be created, press '*Add new*'. Type the name to the '*Protocol name*' box. Drop down list '*Discipline*' displays some pre-defined disciplines that affect the formula of VO2max calculation. Group box 'Workload' specifies the starting workload at the first stage of the test, increment after each workload and the unit used to define the workloads.'Duration' group box defines how long each stage lasts. The duration can be given in time or in distance. Distance can be selected only when workload unit is km/h. Averages calculation duration specifies time at the end of the each stage from which the stage heart rate average is calculated. When the protocol values are valid, press '*Save*' and proceed to the next step.

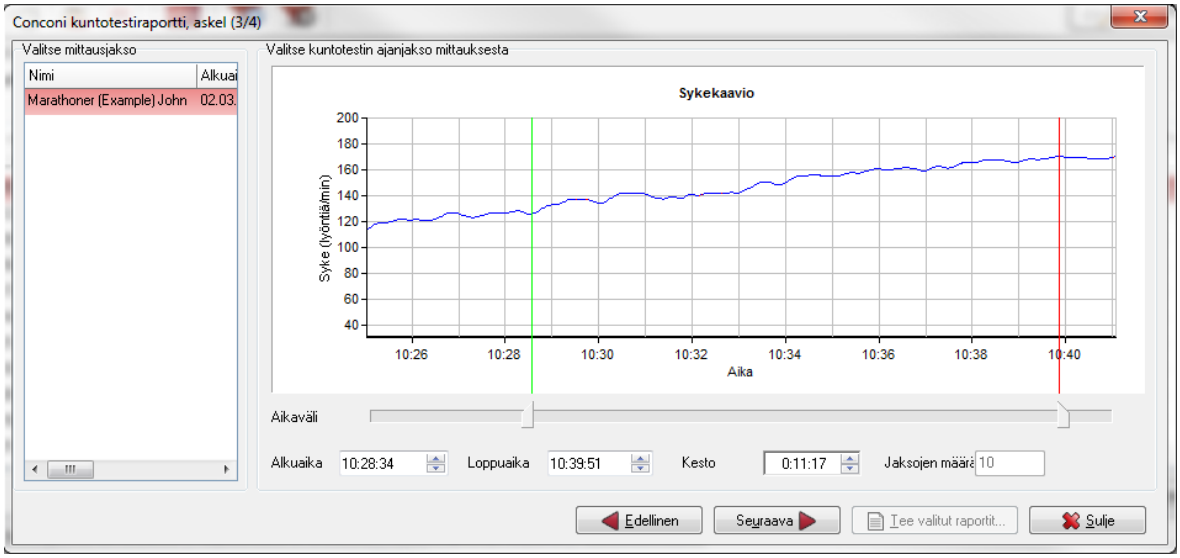

Figure 38. Time period selection for Conconi fitness test report.

In the third step select the start and end times of the testing for each measurement. Select the measurements from the table on left one by one select the test period using the two sliders below the

HR graph or type in the start and end times in the edit fields below the sliders. Each measurement will have certain number of stages depending on the defined protocol and the length of the time period. The number of stages may not exceed 50. Measurements with over 50 stages are shown red on the left side table. To next step cannot be moved until all measurements have less than 51 stages.
After all measurements have testing time period selected, proceed to the final step.

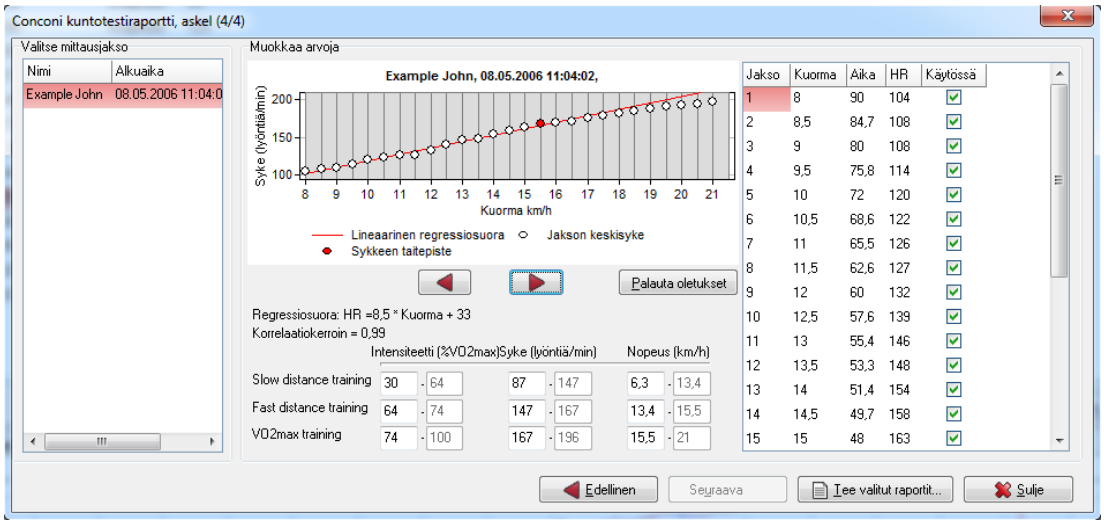

Figure 39. Details of Conconi fitness test report.

The final step lists all measurements on the table on left. If deflection point for a measurement can be calculated automatically, it is shown red on the table. All measurements must have valid deflection point before reports can be created. If the deflection point can't be calculated for one or more measurements, move back to the step 1 with '*Previous*' button and discard those measurements.

Group box '*Edit values'* shows details of the report to be generated. The graph displays HR on the vertical axis and stage number of the horizontal axis. The white dots indicate HR average of the last user defined time period of each stage. Red dot indicates heart rate deflection point. The red line is the linear regression line used on deflection point calculation. The formula of the linear regression line is shown below the graph. Below that there is formula for VO2max calculation. VO2max is not calculated if a predefined formula does not exist for the given discipline and protocol. The constant in the formula can be edited. The correlation coefficient for the linear regression line is shown below the VO2max formula. Intensity limits are shown below the correlation coefficient. They can also be edited. The table on the right lists all stages. The columns have following meanings:

- Number of stage
- Workload at the start of the stage
- Time spent to complete the stage
- Average HR over the specified time (e.g. 30s) at the end of a stage
- Check box determining whether the stage is used in deflection point calculation or not

The deflection point stage is shown red on the table. It can be moved up or down with the red arrows at the below. Initiate report creation by pressing '*Create reports'*.

YO-YO FITNESS TEST REPORT

The Yo-Yo fitness tests involves running continuously between two points that are 20 m apart. These runs are synchronized with a pre-recorded audio tape or CD, which plays beeps at set intervals. The recording is typically structured into 20 'levels', each of which lasts 60 seconds. In beep-test, the interval of beeps is calculated require a speed at the start of 8.5 km/h, which increases by 0.5 km/h with each level. The Yo-Yo test differs from beep-test by 10 seconds breaks between the 2x20m shuttles.
The Yo-Yo fitness test wizard has three steps, the first one for selecting measurements, second one for

selecting test protocol and third one as seen in below.

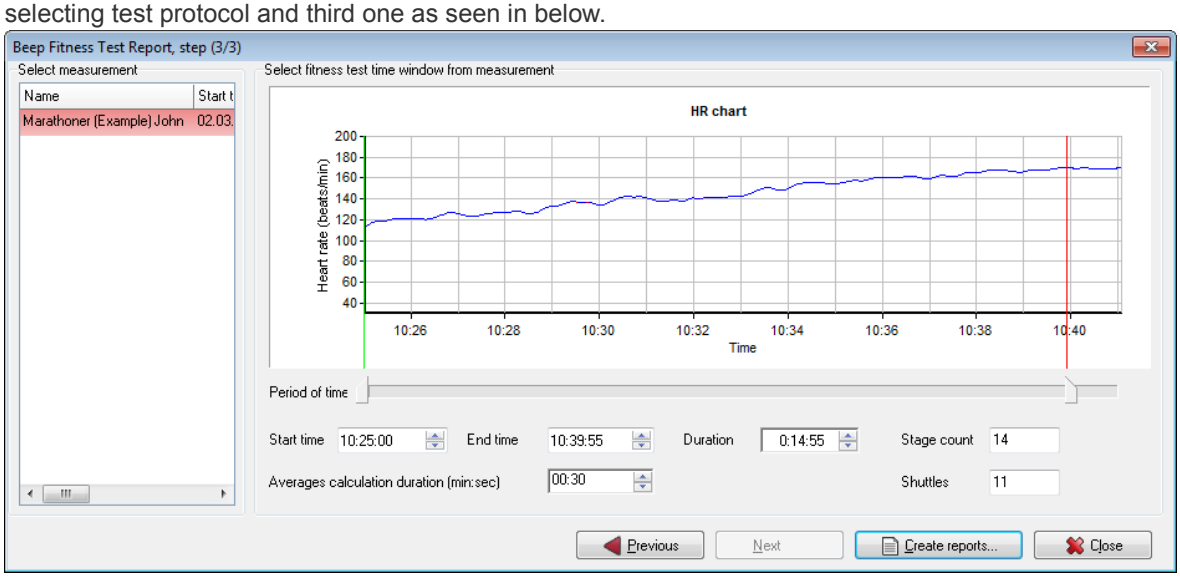

Figure 40. Third and last step of the Yo-Yo fitness test wizard (Beep test protocol).

The last step includes fitness test period selection as in Conconi wizard but it also includes following details for each measurement:

- Stage count, amount of whole stages completed
- Shuttles, amount of shuttles completed in the last stage
- Averages calculation duration (purpose same as in Conconi)

Yo-Yo test includes distance information, which is specified by selected period of time.
The right part of shows information of the measurement selected on the left.

When all settings have been done of each measurement, press '*Create reports'* to have the reports created and opened.

MAXIMAL FITNESS TEST REPORT

Maximal fitness test is a free incremental fitness test. It offers wide variety of options to be specified. It has three different predefined protocols, cycling, rowing and running. The measurement selection step is followed by protocol specification step which can be seen below.

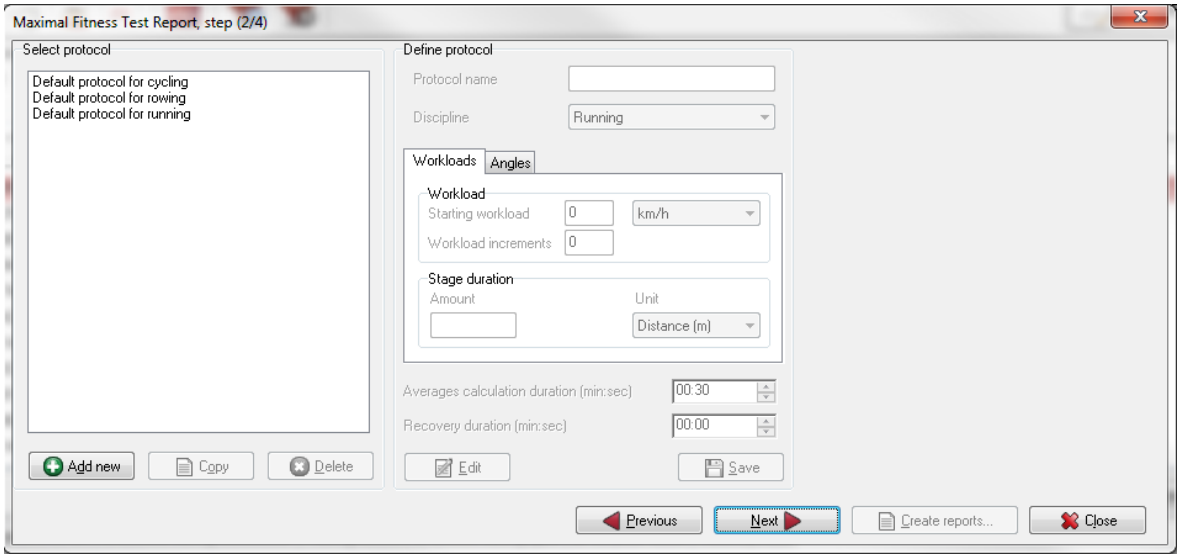

Figure 41. Maximal fitness test protocol step.

The protocol step of maximal fitness test is basically an extended version of Conconi's protocol step with possibility to specify angles. It is possible to use the angles only when workload unit is speed.
Group box 'Angle' has three edit fields which are used to specify angles for each stage:

- 'Starting angle' specifies the angle at start.
- 'Angle increments' specifies how much the angle is increased after each stage.
- 'Increments starting stage' specifies the stage number after which angles are used.

The angles are expressed in degrees. Also, when angles are used, the workload unit in chart appears as VO2. The third step of maximal fitness test is identical to Conconi's. Forth and final step can be seen in below.

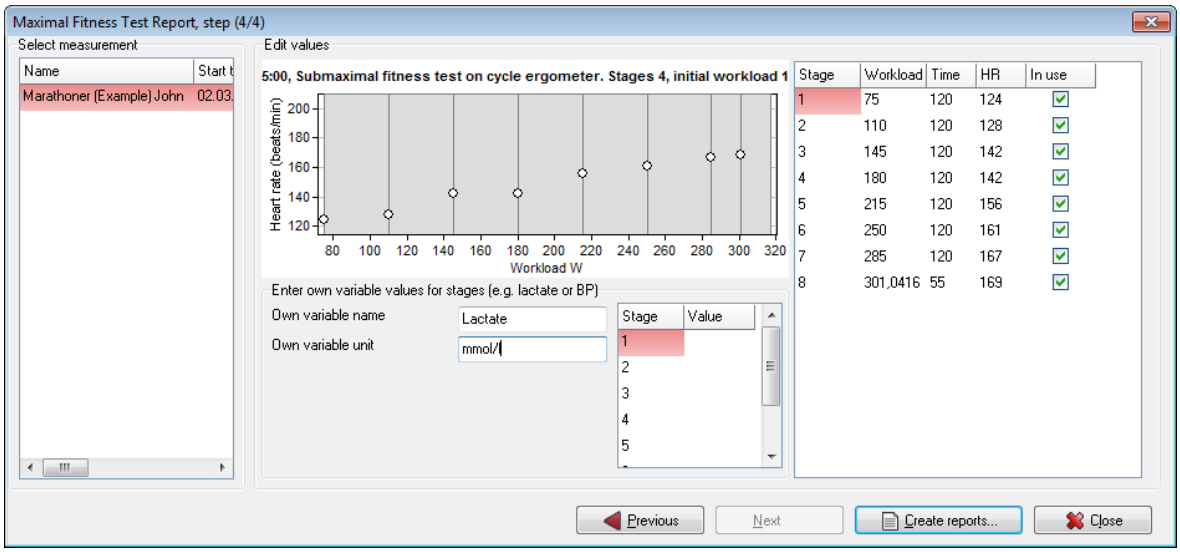

Figure 42. Last step of the maximal fitness test report.

In the last step, the chart displays HR and workload of each stage as well as optional own variable. Own variable does not affect the report's results in any way, it's provided for the user to be able to enter a custom series to the chart. The own variable's name, unit and values are specified in the group box below the chart. The table contains own variable's value for each stage.

The table on the right displays all stages along with their data and has similar behavior as in Conconi.

The angle column is shown if angles were specified as the part of the protocol.
Reports can be finally created with button '*Create reports*'.

SUBMAXIMAL FITNESS TEST REPORT

Submaximal fitness test report is identical to maximal fitness test report with the exception that it is submaximal. The measurement selection step is followed by protocol specification step which can be seen below.

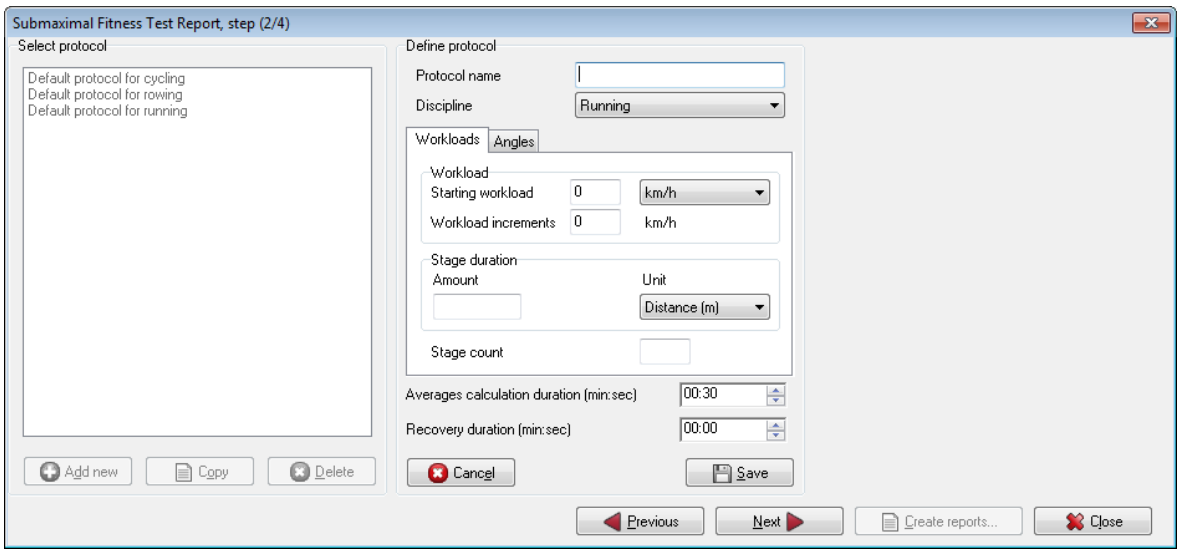

Figure 43. Select submaximal fitness test protocol.

The protocol step of submaximal fitness test report is identical to maximal fitness test's with the exception that is has option to specify the stage count. Stage count signifies the amount of completed stages in the submaximal fitness test. As the user moves to the third step, the point of maximum HR of the measurement is automatically selected as the end point of the test time period.
The final step can be seen in illustration below.

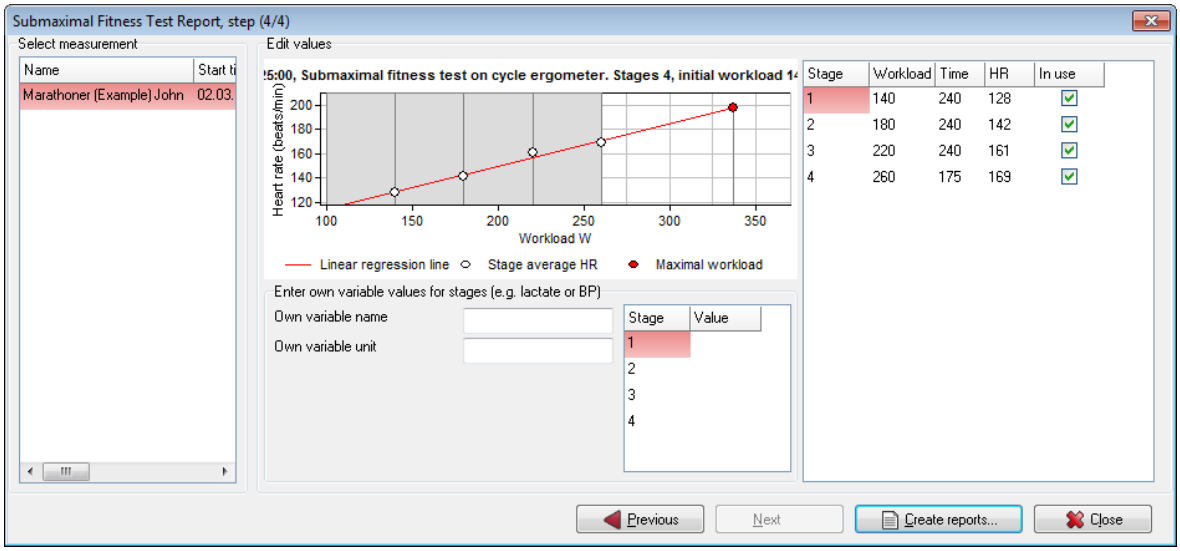

Figure 44. Last step of the submaximal fitness test report

The final step is the same as in maximal fitness test but it also contains an estimate for the maximum

workload. The estimated is based on the linear regression line and person's maximum HR. The estimated maximum workload is shown as red dot on the chart and red line is the linear regression line. Rest of the step has same behavior as in maximal fitness test wizard.

UKK WALK TEST

The UKK two-kilometer Walk Test is familiar to many thousands of Finns and is known beyond the borders of Europe too. The Walk Test is in use in 22 countries. It is a simple and safe physical fitness test designed to measure the respiratory and cardiovascular performance of normally active men and women. The UKK walk test wizard has two steps, the first one is the measurement selection, the second and last one can be seen below.

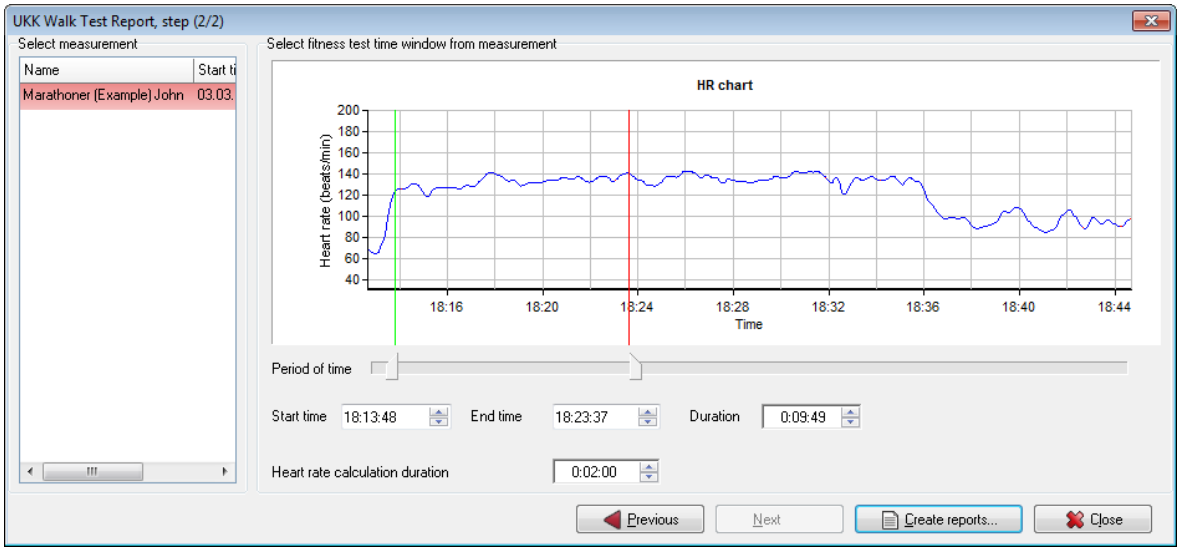

Figure 45. Second step of the UKK walk test.

The second step features test period time selection as seen in other fitness test reports. The only difference is edit field 'Heart rate calculation duration' which specifies the time at the end of the test period of which average HR is calculated.

Reports can be created with button '*Create reports'*.

COOPER FITNESS TEST

1. Create Cooper fitness test report by selecting *'Fitness tests'* → *'Cooper fitness test'* from upper menu bar
2. Select Cooper fitness test measurement from the left list and press *'Add*'.
3. Click '*Next*'
4. Select 12 minutes time period from the HR graph and type the distance in distance field.
5. Click *'Create report'*

FITNESS TEST BROWSER

Fitness test browser is a tool to monitor already created fitness test. In the browser dialog all the implemented tests are listed. Tests can be filtered by the type or by the time they were created. Tests can be also selected from a group. The info about the tests can be viewed by clicking the test at the Created fitness test table. The details of the test are shown in the text box at right.

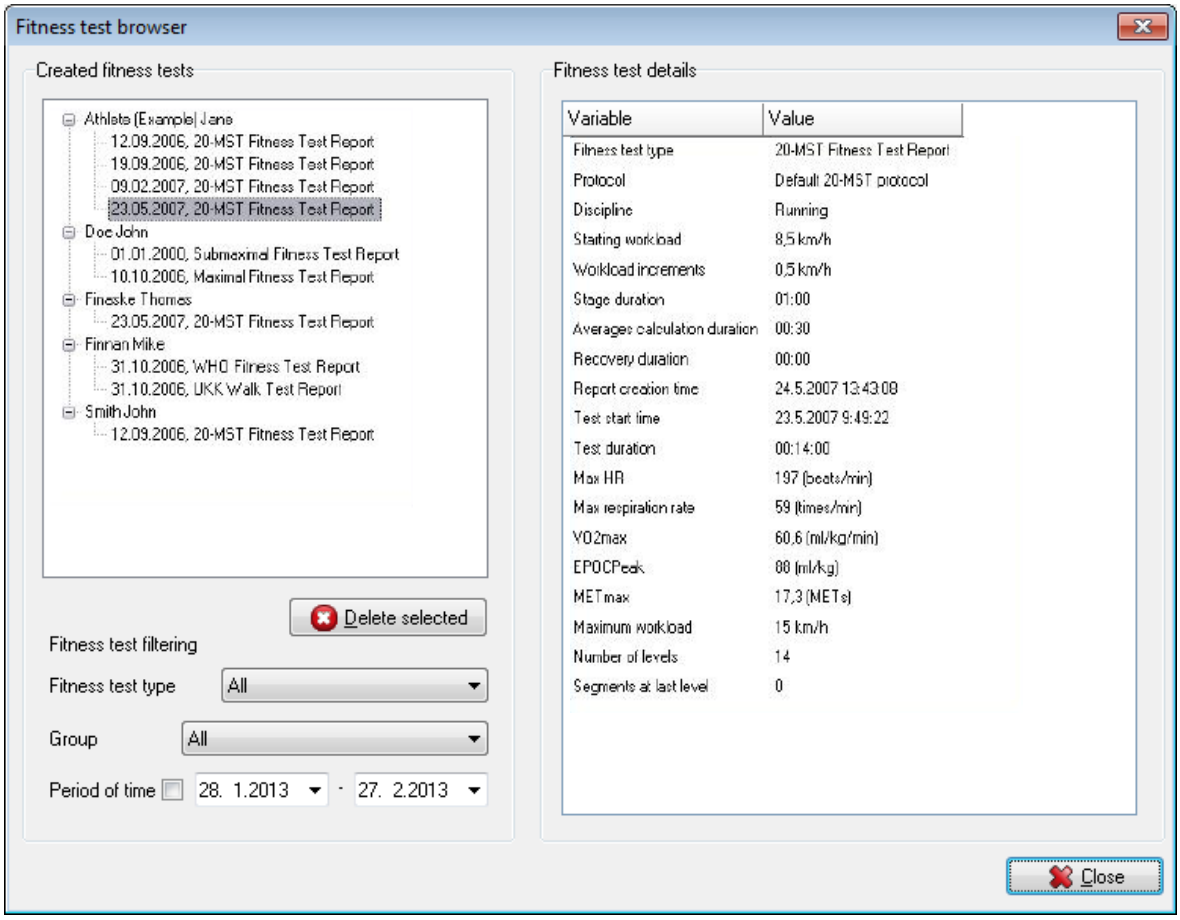

Figure 46. Fitness test browser.

FITNESS TEST FOLLOW-UP REPORT

In fitness test follow-up report personal development between two or more fitness tests is shown. The follow-up report can only be done between fitness tests performed with the same protocol.

1. Select '*Tools*' -> '*Fitness follow-up report*'
2. Select type of fitness test
3. Select the protocol and the tests that are included to the report.
4. Press '*Create report*'

DATA ANALYSIS REPORT

This chapter provides information how to create the Data analysis report from selected measurement period and what physiological variables you have available for the report. You will find also information about languages you have available for the report and what you should take into account when creating the report.

General chart of the chosen measurement and variables produced by analysis in graphical mode can be examined using data analysis report. The measurement can be treated as a whole or split into shorter periods. PDF-report can be made from selected variables during the wanted period.

- Physiological state overview
- Artifact corrected heart rate
- Artifact corrected R-R interval
- Respiration rate
- Ventilation
- EPOC
- VO_2
- VO_2max %
- HF Heart rate variability
- LF Heart rate variability
- VLF Heart rate variability
- RMSSD
- Energy expenditure
- Fat % expenditure
- Cumulative exercise induced (net) energy expenditure

CREATING DATA ANALYSIS REPORT

1. Start data analysis report by choosing '*Reports*' -> '*Data Analysis Report*'
2. You can examine different charts by choosing the wanted variable from the '*Chart*' menu.
3. If you want to select certain period instead of the whole measurement, set cursors to the right places. The new temporary measurement period is analyzed from the selected time period and reports are created from that period. The temporary measurement period is not saved.
4. If you want to create a report, choose charts presented in data analysis report from the data analysis report tab one by one or select all.
5. Press *'Create report'*.
6. Select destination and name the report.
7. Press '*Save*'.

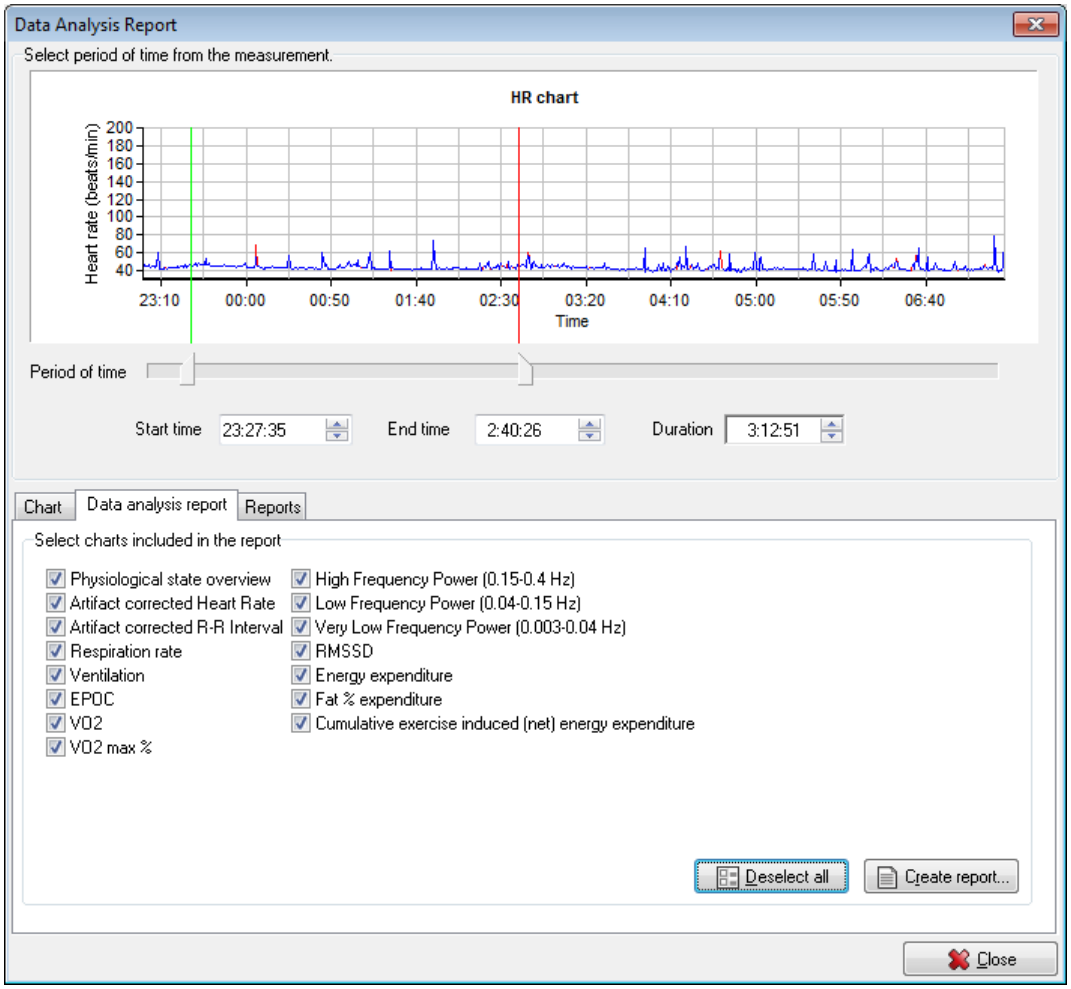

Figure 47. Data analysis report tool

In addition to data analysis report, you can also create basic reports in the reports tab.

Creating a report in the data analysis window.

1. Select language, reports and curves shown in the training chart.
2. Press 'Create reports'.
3. Select destination and press 'OK'.

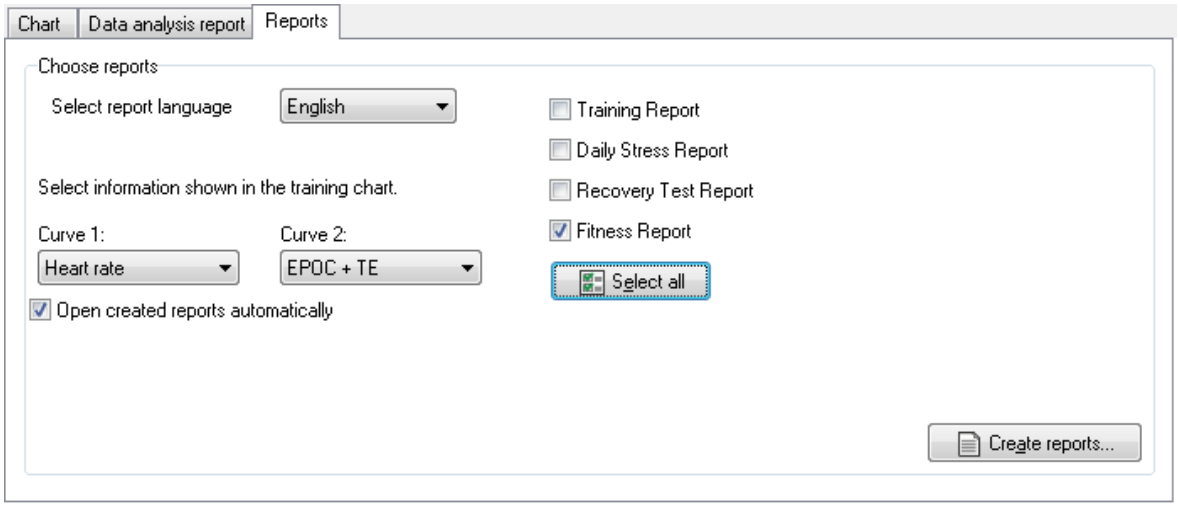

Figure 48. With the data analysis report tool you can create the basic reports from the selected time period.

TRAINING MONITOR

From this chapter you get the information how to start using training monitor at first time. You will find also the information what training monitor settings you can manage.

Training monitor is a tool for monitoring group up to 80 people at the same time. Team coaches can use the monitor to follow the performance of their athletes during the training. Suunto team pod, Suunto PC pod, Firstbeat Dongle or Firstbeat Team Receiver is required to operate the training monitor.

The following measures can be monitored with Training Monitor:

- HR
- EPOC
- EPOCpeak
- %VO2max
- %HRmax
- TE
- kcal(sum)
- TRIMP

Up to four of the measures can be monitored at the same time.

TRAINING MONITOR SETTINGS

Before you start the training monitor use at first time it is good to customize the training monitor settings to serve your purpose in best possible way.

1. Open the training monitor setting from the upper menu bar by clicking 'Tools' → ' *Settings*' and from the settings dialog '*Training monitor'* tab.

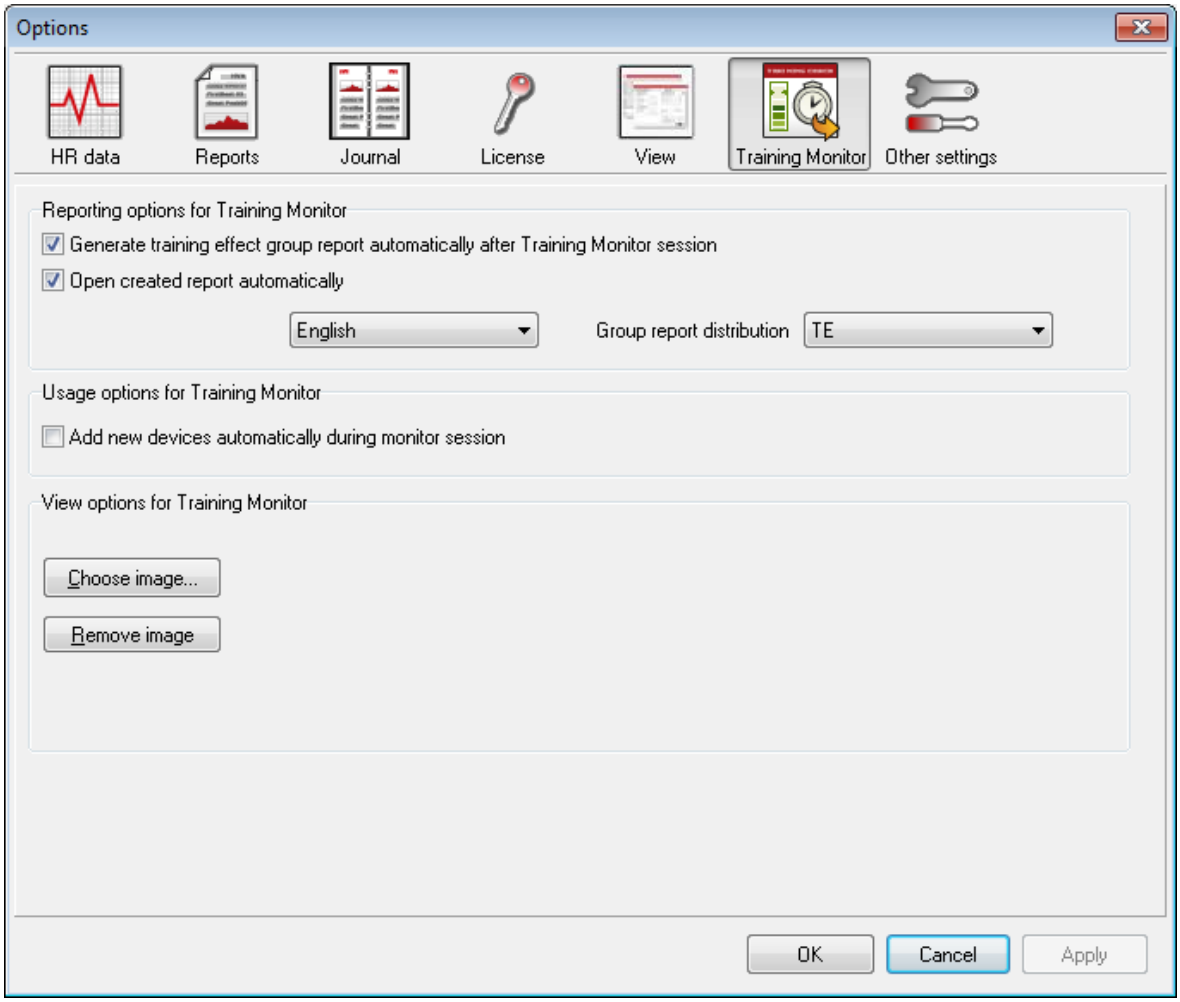

Figure 49. Training monitor settings

2. From the training monitor reporting options can be defined training monitor automatic features. By selecting '*Generate training effect group report automatically after Training monitor session*' the program generates the training effect group report automatically in the Firstbeat folder. By selecting 'Open created group report automatically' the program open generated group report automatically after Training monitor session. You can select also report default language and the training distribution.
3. From the Usage options for training monitor you can select *'Add new devices automatically during the training monitor session'*. This feature takes all the already paired user profiles in to the monitor session automatically, example if some athletes arrive latter to the training. You can manage this setting also during the training monitor session.
4. From the training monitor view options you can select background picture for the training monitor.
5. Accept made selection by pressing '*OK*'.

START TRAINING MONITOR MEASUREMENT AT FIRST TIME

When you start the training monitor session at first time you may should reserve time to prepare the system for training session.

1. Share the heart rate belts for the persons being monitored and keep a list of belt IDs in order to pair the belt to right person. Heart rate belt ID number you will find from the back side of the hr belt.

Figure 50. Firstbeat HR Belt ID number.

2. Connect the receiver to the computer USB port
3. Click the Training monitor icon from the icon menu.

4. Link profile and belt according to the belt ID found at the backside of the belt. At least one person has to be selected from the drop down list. Profiles can also be filtered by group to ease the profile selection. If belt does not have Profile selected it cannot be displayed
    - If an athlete does not have profile in the Firstbeat SPORTS, it is possible to add one by pressing the '*Add profile'* button.
    - New user can also be created to Training Monitor in the middle of a monitoring session, see below.
5. Select 'Remember' check box in order to link belt and profile next time the Training Monitor is used.
6. Select variables which Training Monitor should display during exercise. Up to four measures can be chosen for multiple persons. The order of the measures can be changed at the right by dragging them with mouse.
7. Press '*Start monitoring'* when you are ready.

USE OF THE TRAINING MONITOR DURING THE TRAINING SESSION

The training monitor displays the selected measures for the profiles. Different displays can be browsed by using interleafs below the screen. If %VO_2max measure is selected, it shows color indicating type of endurance training. There can be up to five limits which can be determined in Profile Information. The colors of different endurance training areas are explained at the bottom of the screen.
Timer is shown all the time and can be used to observe duration of the exercise. Timer includes lap time option.

If '*Add new devices automatically'* is selected, Training Monitor adds those belts which are already attached to specific profile automatically in Training Monitor. Pressing '*Manage profiles and groups'* displays all belts in the receivers range during the measurement. Monitored users can be added to and removed from Training Monitor in the middle of the monitoring session. Training monitor automatically interpolates R-R data when there is a connection problem with the belt.

By clicking the 'Manage groups and profiles' you can also mange group tile feature. This feature allows you to follow selected group average information at real time.

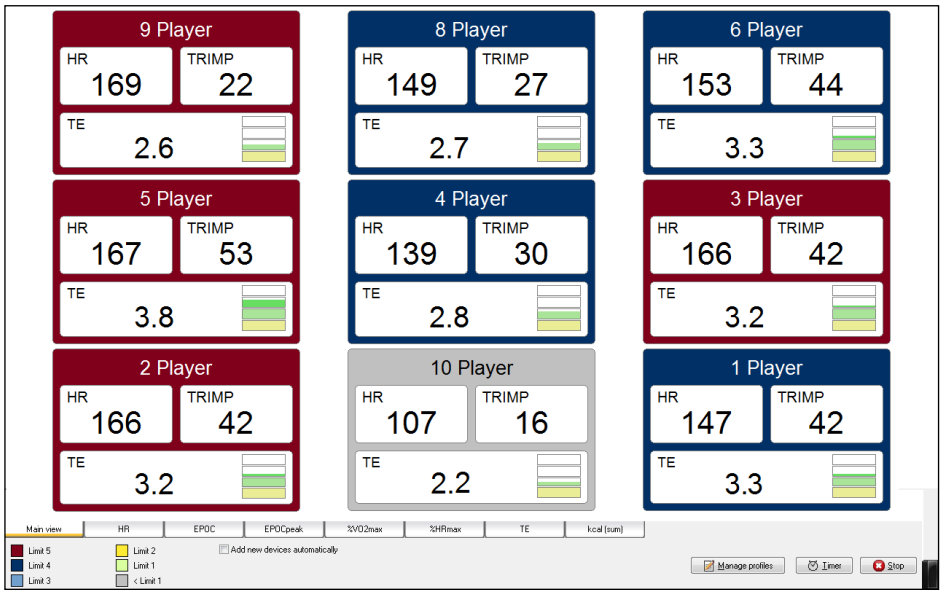

Figure 51. Main view of the training monitor.

END TRAINING MONITOR MEASUREMENT

Press '*Stop*' button to stop monitoring and collecting data from belts. When monitoring is stopped, program shows the collected measurements for each athlete. Select the measurements by clicking check boxes that will be saved. Each chosen measurement is saved to selected athlete's profile. Notes can be given for measurements after a Training Monitor session has been completed. These notes will be shown in each saved measurement. When ready, press '*OK*' and analysis is done.

There are automatic functions after a Training Monitor session has been completed:

- Fitness report and measurement export file are sent by e-mail
- Training Effect Group report is created from all measurements

Fitness report settings can be turned on/off for every profile from profile management and Training Effect Group report from the Options dialog.

QUICK RECOVERY TEST

Quick recovery test is a 5 minutes test to be used in assessing athlete's readiness prior to training. From this chapter you will find the instructions to make the test in real time or post analysis from already collected data.

The test procedures are recommended to be standardized to ensure reliable test results. The suggested protocol is the following:

- Repeat the test always in the same time slot (e.g. prior to training in the locker room)
- Perform the test in a silent environment where the athletes are able to relax properly
- Avoid physical activity, energetic drinks and meals before the test
- Repeat the test on regular intervals using the same standardized preparation protocol

Recovery score is based on heart rate and heart rate variability analysis and advanced filtering of the data. The recovery score is presented in percentages compared to the highest record in history. Therefore the first two tests will provide you the score of 100% or 0%. The results of the test will become more meaningful as the number of tests in the measurement history increase.
Quick Recovery Test is designed to provide a quick and easy screening tool for groups. Athletes with the lowest recovery score are suggested to be monitored overnight (Overnight recovery test) to confirm the

results.

REAL TIME QUICK RECOVERY TEST

Before you start the real time quick recovery test, check that you have the user profile created for every measured person. You can create new user profiles via profile and group management tool.

1. Start the quick recovery test wizard by clicking the quick recovery test icon.

2. Please read the info dialog instructions carefully.

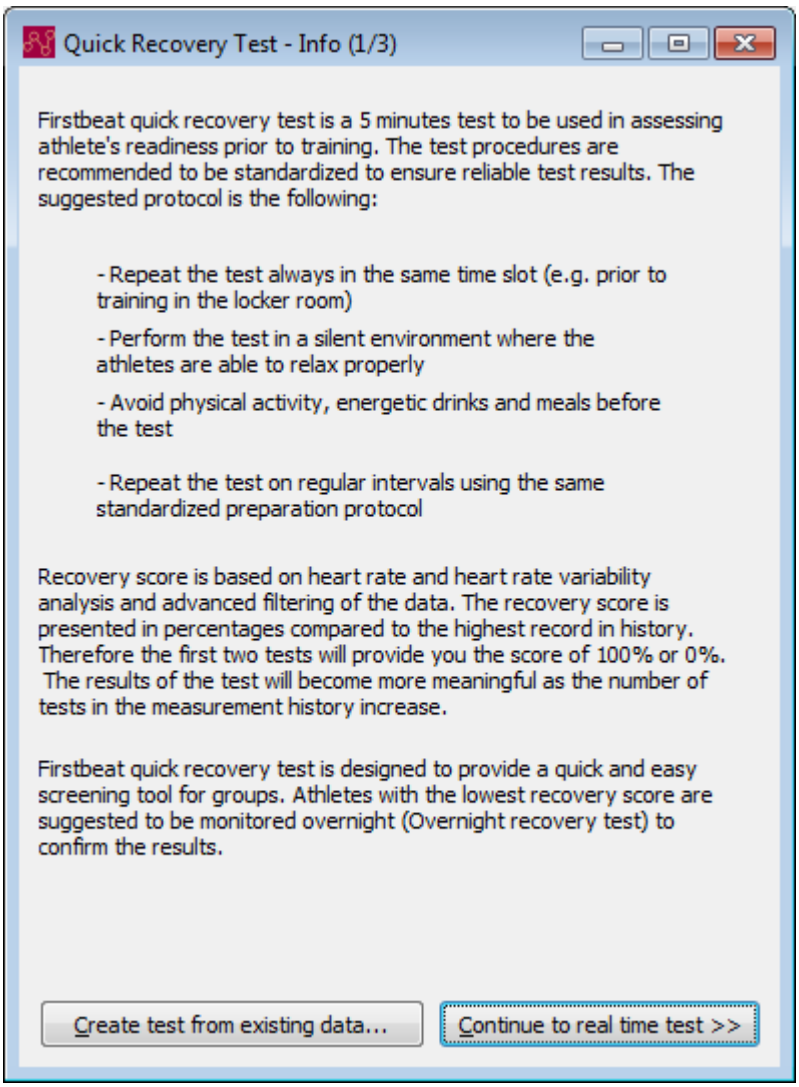
Quick Recovery Test - Info (1/3)
Firstbeat quick recovery test is a 5 minutes test to be used in assessing athlete's readiness prior to training. The test procedures are recommended to be standardized to ensure reliable test results. The suggested protocol is the following:
- Repeat the test always in the same time slot (e.g. prior to training in the locker room)
- Perform the test in a silent environment where the athletes are able to relax properly
- Avoid physical activity, energetic drinks and meals before the test
- Repeat the test on regular intervals using the same standardized preparation protocol
Recovery score is based on heart rate and heart rate variability analysis and advanced filtering of the data. The recovery score is presented in percentages compared to the highest record in history. Therefore the first two tests will provide you the score of 100% or 0%. The results of the test will become more meaningful as the number of tests in the measurement history increase.
Firstbeat quick recovery test is designed to provide a quick and easy screening tool for groups. Athletes with the lowest recovery score are suggested to be monitored overnight (Overnight recovery test) to confirm the results.
Create test from existing data...
Continue to real time test >>

Figure 52. Quick recovery test's info dialog.

3. Plug the Receiver to computer and guide the test persons to wear HR belts on.
4. Click *"Continue to real time test"* when you are ready to start preparation for the test.

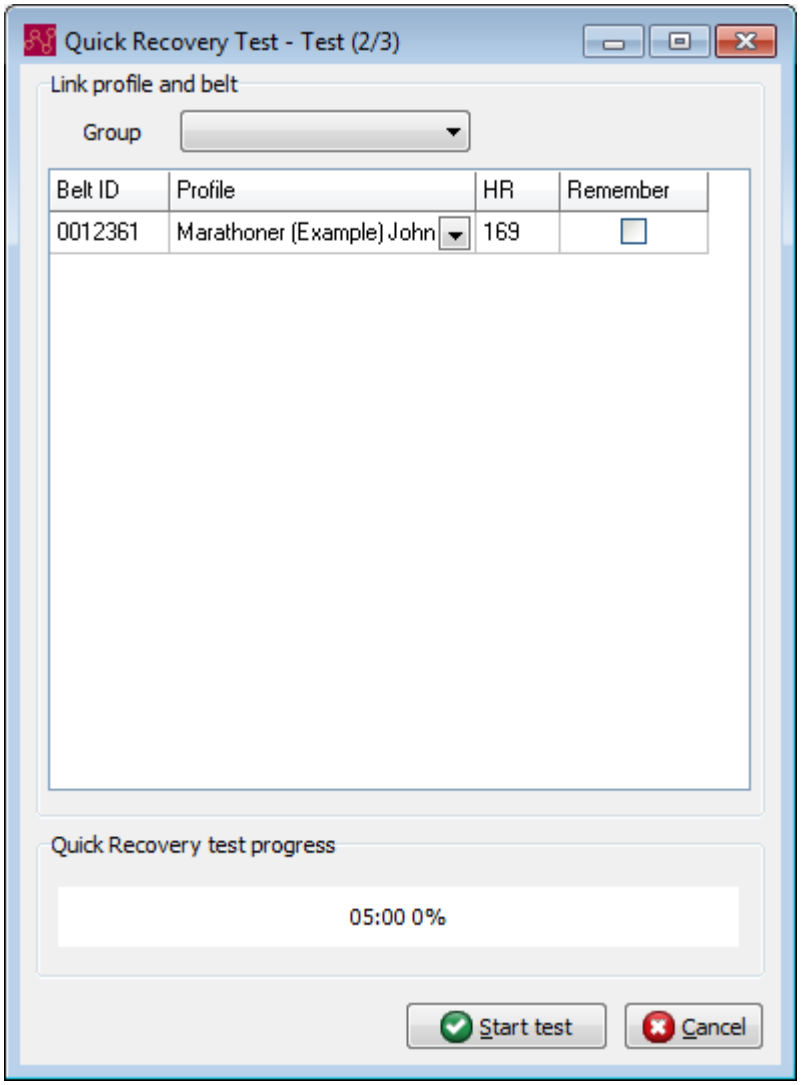

Figure 53. Real time quick recovery test

5. Link profile and belt according to the belt ID found at the backside of the belt. At least one person has to be selected from the drop down list. Profiles can also be filtered by group to ease the profile selection. If belt does not have Profile selected it cannot be displayed.
6. Select 'Remember' check box in order to link belt and profile next time the Quick Recovery Test is used.
7. Check from the HR column that every person is relaxed before the test.
8. Press '*Start test*' when you are ready.

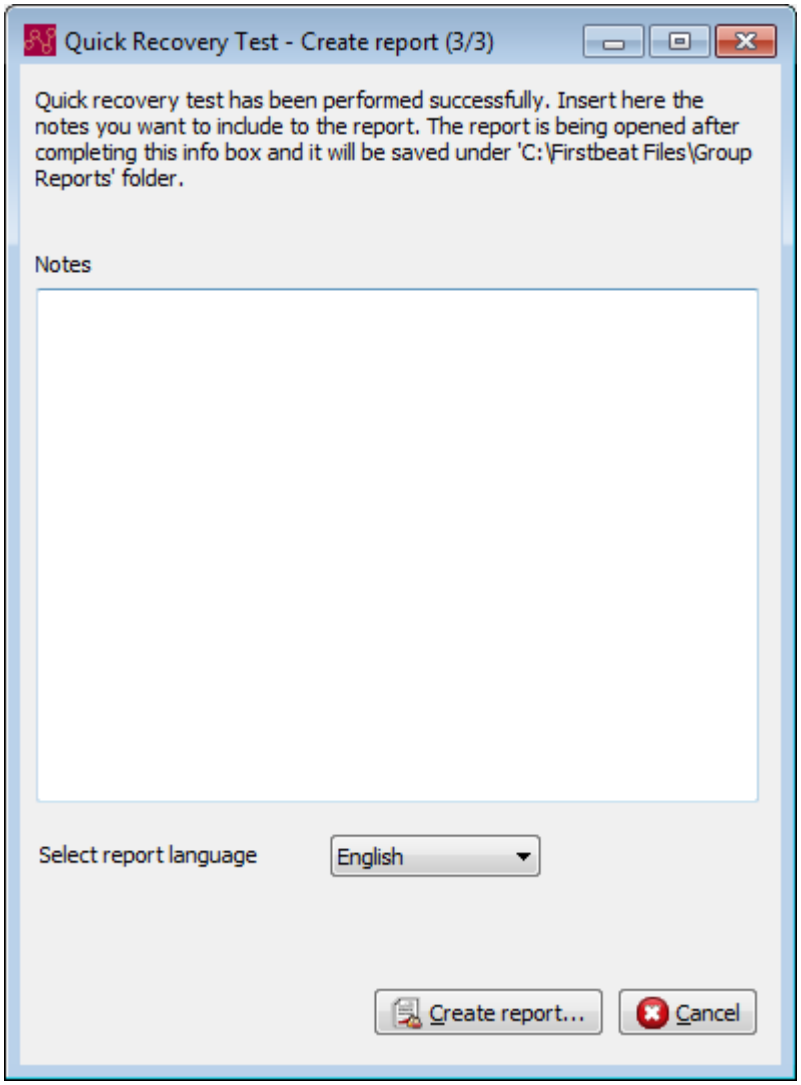
Quick Recovery Test - Create report (3/3)
Quick recovery test has been performed successfully. Insert here the notes you want to include to the report. The report is being opened after completing this info box and it will be saved under 'C:\Firstbeat Files\Group Reports' folder.
Notes
Select report language
English
Create report...
Cancel

Figure 54. Real time quick recovery test report creation.

9. When test is completed write notes for the test and select report language.
10. Click '*Create report' and* get known to quick recovery test interpretation guide at Firstbeat SPORTS learning center. http://www.firstbeat.fi/professional-sports/learning-center.

QUICK RECOVERY TEST FROM ALREADY COLLECTED DATA

You can create quick recovery test also from already collected data. For the reliable test results it is recommended to use measurements periods which are measured with same test protocol as normal quick recovery test.

1. Start creating quick recovery test from already collected data by clicking the '*Quick recovery test*' icon.
2. Read the '*Quick recovery test info*' dialog carefully.
3. Select '*Create test from existing data*'

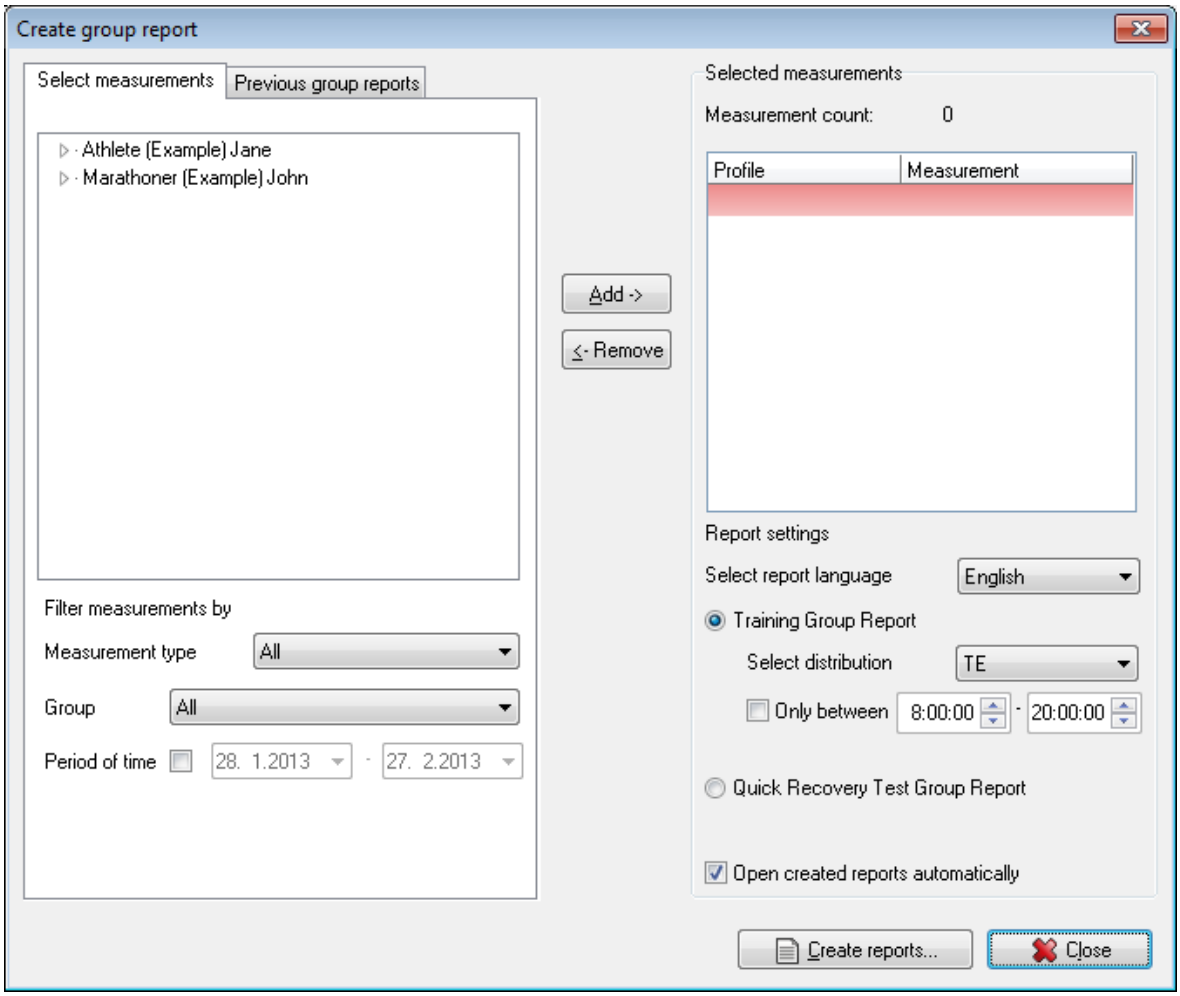

Figure 55. Create group report dialog

4. Select quick reovery test measurements from the left list.
5. Select *"Quick recovery test group report" from right side.*
6. Click *'Create reports'*
7. Write notes to the notes field and click '*OK'.*
8. Now the report is ready and you can find the report at default C:\Firstbeat Files\Group Reports.
9. Read up the quick recovery test interpretation guide from http://www.firstbeat.fi/professional-sports/learning-center

E-MAIL

From this chapter you find the instructions how send and receive measurements via e-mail.

E-mail feature is especially useful when several Firstbeat softwares are used to collect and analyze HR data but all measurements is wanted to be kept centralized in one application. In this kind of situation it is recommended to create a new e-mail account for the main application and determine that e-mail account into the program's settings. When this is done, selected measurements can be sent by e-mail from other Firstbeat applications to the main application. Personal parameters and identification information used in measurements are sent in addition to the measurement information. When measurements are received, SPORTS checks if personal information of received profile has already been created. If personal profile has been determined, SPORTS suggests the measurement to be added to the user profile. Otherwise, it is suggested to add a new profile. If same measurements are brought to existing profile, system asks if duplicates are formed. Measurements are interpreted to be duplicates if start time and duration of the measurement are same. Person is recognized based on name and date of birth.

E-MAIL SETTINGS

You can define e-mail settings in Tools → Settings →Other settings → e-mail settings.

SEND MEASUREMENTS BY E-MAIL

The selected measurements can be sent using e-mail. E-mail settings can be determined by clicking '*Tools*' -> '*Other settings*' -> '*E-mail settings*'.

1. Select one or more measurements from the Measurements list.
2. Choose 'File' -> 'Send by e-mail'. If e-mail settings have not been determined, e-mail settings tab of the settings dialog opens.
3. Write e-mail address to which measurements are sent and click 'OK'.

RECEIVE MEASUREMENTS BY E-MAIL

You can check if any measurements have arrived to your e-mail by choosing *'Check e-mail'* from the file menu. Arrived measurements can be read to the system. E-mail settings can be determined in '*Tools*' →'*Other settings*' → *'E-mail settings'*.

FIRSTBEAT CLOUD

From this chapter you will get the information how to use Firstbeat cloud service.

Firstbeat cloud can be used for transferring person profiles and measurements to the server. In this way you can share the information between several SPORTS users and use the service as a cloud back-up. The athletes can also load data to server via Firstbeat Uploader remotely. Please contact you Firstbeat contact person to get more infromation about Firstbeat cloud.

FIRSTBEAT CLOUD SETTINGS

When starting synchronization for the first time, select '*Tools*' -> '*Options*'. Select '*Other settings'* -> '*Synchronizing*'.

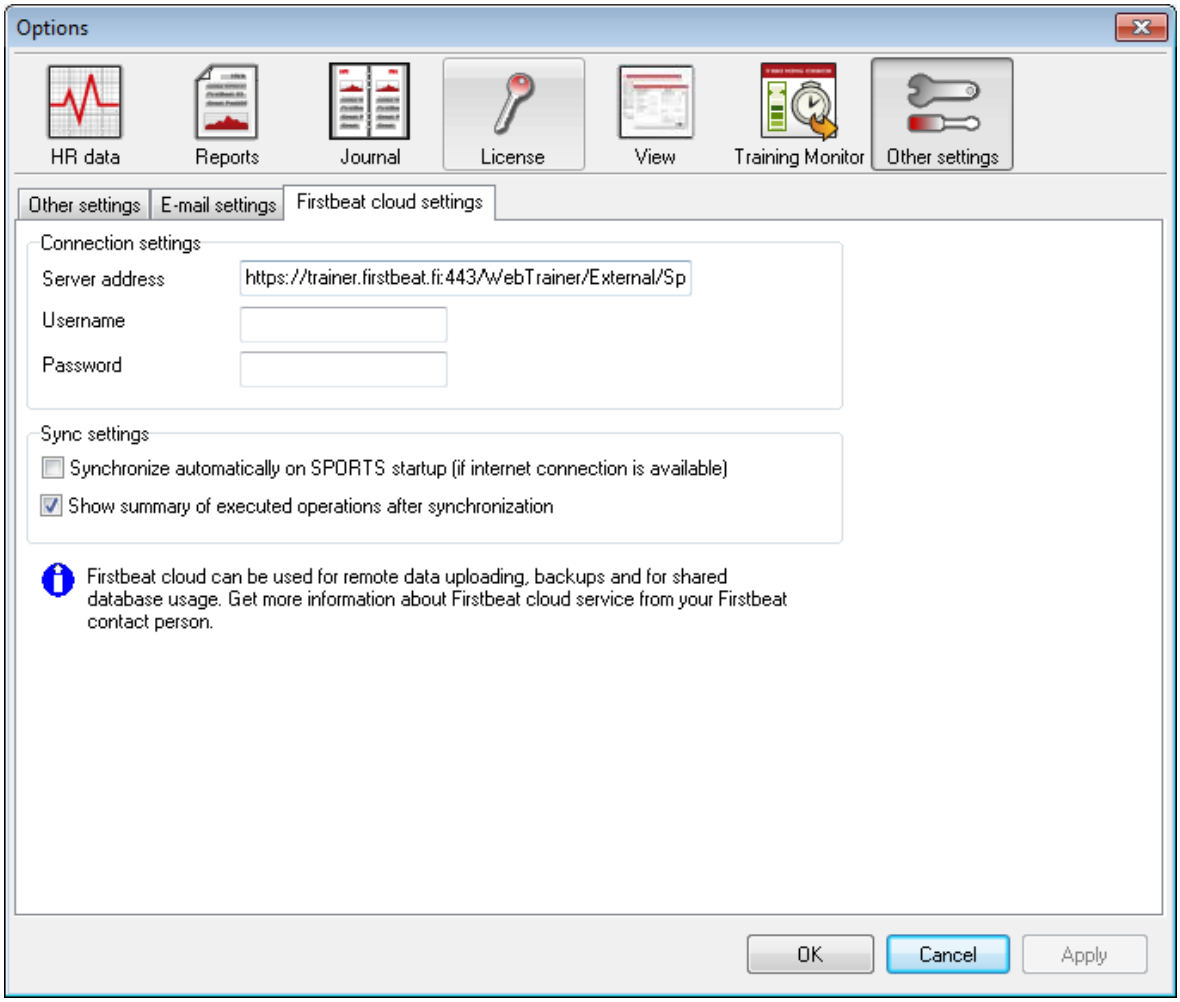

Figure 56. Firstbeat cloud settings

The Server address default is Firstbeat server URL. In case of having server of your own, use this format:
https://<your.server.domain>/WebTrainer/External/Sports30
where the <your.server.domain> is replaced with your server domain name.
Give your server username and password (requires trainer priviledges in the server).
Check the Synchronize automatically check box to have the SPORTS synchronize each time during start-up. Check the Show summary check box to get summary of each synchronization event.

SYNC TOOL

Select '*Tools*' -> '*Synchronization tool*'. SPORTS connects to the server and opens the dialog below.

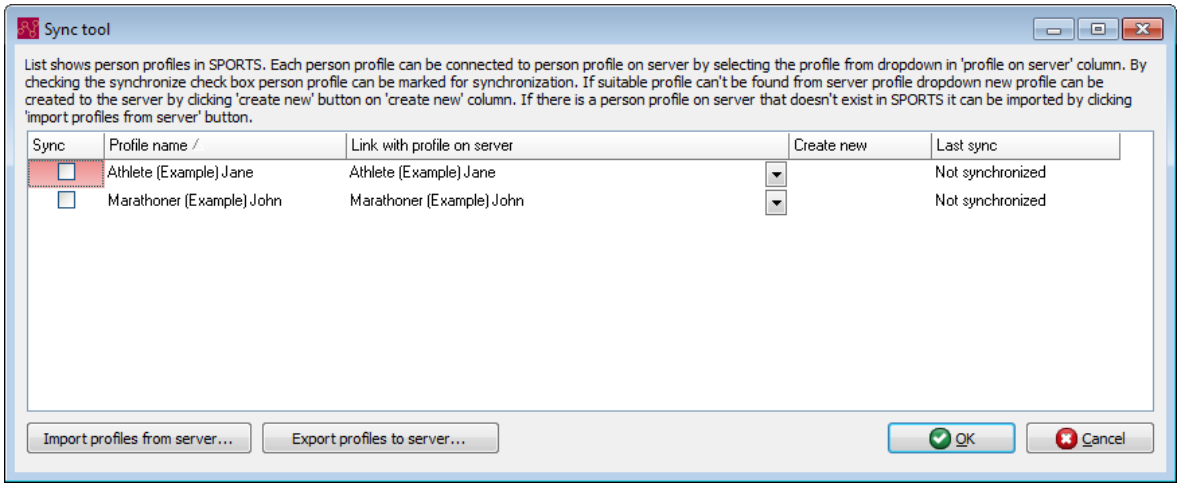
Sync tool
List shows person profiles in SPORTS. Each person profile can be connected to person profile on server by selecting the profile from dropdown in 'profile on server' column. By checking the synchronize check box person profile can be marked for synchronization. If suitable profile can't be found from server profile dropdown new profile can be created to the server by clicking 'create new' button on 'create new' column. If there is a person profile on server that doesn't exist in SPORTS it can be imported by clicking 'import profiles from server' button.
Sync
Profile name
Link with profile on server
Create new
Last sync
Athlete (Example) Jane
Athlete (Example) Jane
Not synchronized
Marathoner (Example) John
Marathoner (Example) John
Not synchronized
Import profiles from server...
Export profiles to server...
OK
Cancel

Figure 57. Main view of the sync tool

The column '*Profile name'* lists the profiles in SPORTS and the column '*Link with profile on server'* lists the profiles in the server. Profiles are automatically printed on the same row if their full names and birthdates match. If the profile needs to be synchronized with other profile that doesn't have matching name or birthday it can be selected from the drop down list that includes all the profiles in the server (excluding the profiles in which privacy settings prevent this). Every match that needs to be synchronized has to be checked active from the 'Sync' column. If there is no match for the certain SPORTS profile, the corresponding profile can be created by clicking '*Create new*' button.

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CREATE PROFILE TO THE SERVER

1. Open sync tool by clicking *'Tools'* → *'Sync tool'*.
2. Click *'Create new'* under that profile which profile you want to create to the server.

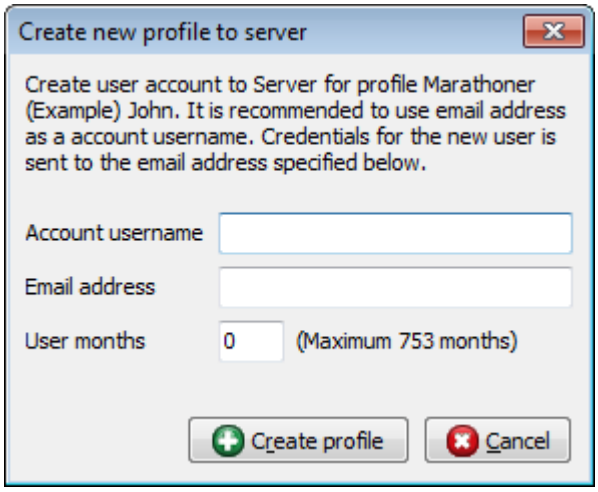
Create new profile to server
Create user account to Server for profile Marathoner (Example) John. It is recommended to use email address as a account username. Credentials for the new user is sent to the email address specified below.
Account username
Email address
User months
0
(Maximum 753 months)
Create profile
Cancel

Figure 58. Create new profile to server

3. Give the account username and email address for the new server profile. If the customer account requires user months, give the number of user months also. Clicking *'Create profile'* sends the username and password to the given email address.

IMPORT PROFILE FROM THE SERVER

If there is no match for the certain server profile it can be imported straight from the server by clicking '*Import profiles from server*' button.

1. Open sync tool by clicking '*Tools*' → '*Sync tool*'.
2. Select 'Import profiles from the server'
3. In Import dialog is listed all the server profiles names. Select which profiles you want to import from the server.
4. By clicking the Import profiles the program imports the select profiles from the server to the sports.

EXPORT PROFILES TO THE SERVER

You can export one or several profiles to the server easily by clicking "export profiles to the server" in cloud sync window.

SYNC PROFILES

During synchronization SPORTS compares the local profile to the one in server. If there are differences between the profiles, SPORTS asks for which profile is correct. Then all the measurements are synchronized into both directions. To manually synchronize single profiles, click the Synchronize button below the measurements table. (The button is enabled only if the profile is selected for synchronization.)

To manually synchronize all profiles, select Synchronize all in the Tools menu. This synchronizes all the profiles selected to be synchronized in the Synchronization tool.

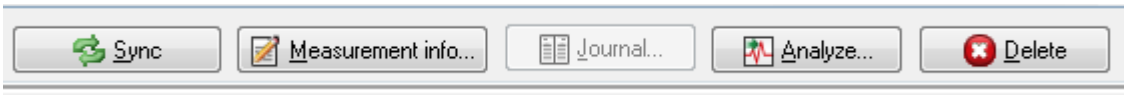

Figure 59. Sync button under the measurement table

During the synchronization process, the progress bar tells to user the status of the synchronization, how many profiles are synchronized etc. and if differences are found the program asks which one's values to use.

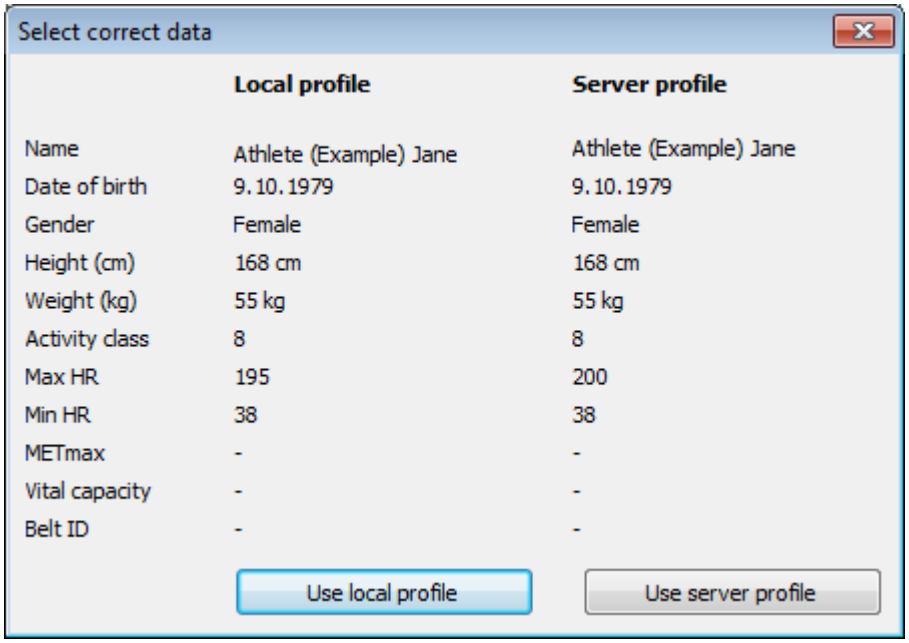

Figure 60. Comparison of the profile background info.

When the synchronization is ready the summary of the synchronization appears. Uncheck the Show summary check box to have it not shown anymore after synchronization.

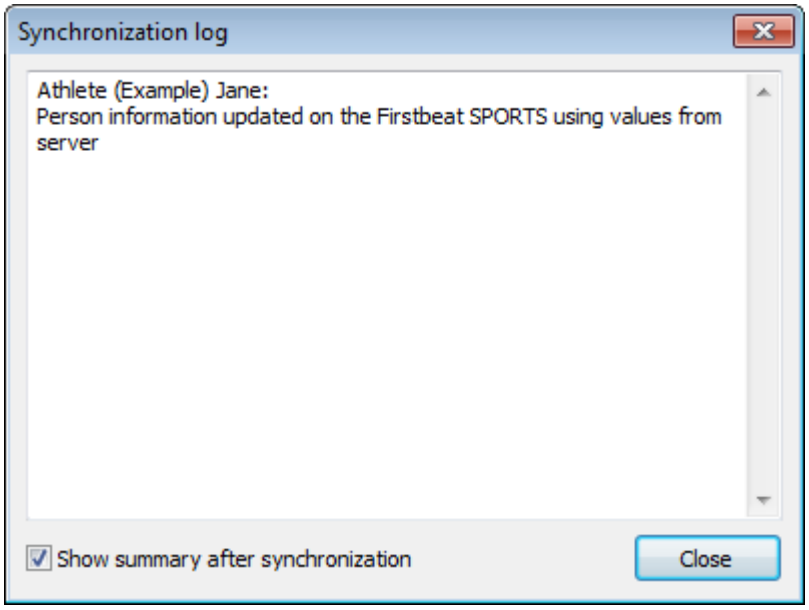
Synchronization log
Athlete (Example) Jane:
Person information updated on the Firstbeat SPORTS using values from server
Show summary after synchronization
Close

Figure 61. Sync log.

SYSTEM BACKUP

This chapter provides information what data you can backup from the Firstbeat SPORTS via system back up feature.

System backup can be created to ensure that no data will be lost in case of a system or a program failure. System backup saves all the data from SPORTS, including the profiles, measurements and settings.

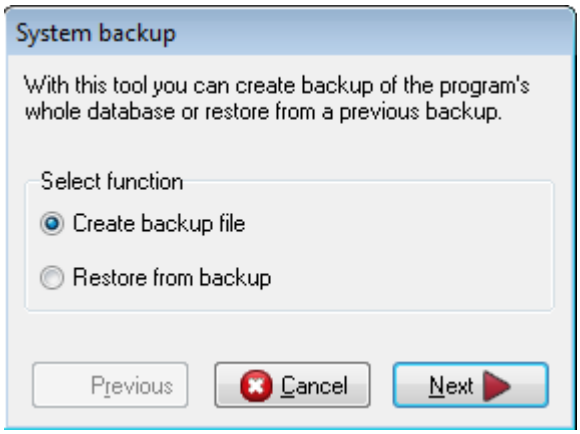

Figure 62. System backup dialog.

CREATE SYSTEM BACKUP

By clicking system backup in file menu invokes a selection whether to create or restore a backup file. Choosing to create a backup file, next step is to define the folder where the program saves the backup. After selection press ‘Execute’ to make the backup.

RESTORE FROM SYSTEM BACKUP

If wanted to load a backup, choose ‘Restore from backup’. Next choose the file from where the backup data is wanted to be loaded. Next press ‘Execute to restore the data’.